

# AMERICAN ARTISAN

MAY  
1941



RESIDENTIAL AIR CONDITIONING  
WARM AIR HEATING • SHEET METAL CONTRACTING

ESTABLISHED  
1 8 8 0

# TIME

Now - **is an All-Important Factor in Ductwork Installation!**

**SOLD**  
AIR CONDITIONED

With American Industry in high gear to meet the enormous demands for defense material, residential building is a prime defense need. Air conditioning systems are being installed under specification in most new defense homes. Thus immediate installation is the need of the hour. Available shop capacity and skilled installation labor are vital.

## LAMNECK ENGINEERING

Anticipates all these needs. Assembly time is actually reduced with Lamneck Prefabricated Duct and Fittings. Its simplified installation releases skilled labor to more necessary defense jobs. Lamneck fittings available at your nearby distributor will relieve your overworked shop.

## PREFABRICATION PROFIT

Naturally, our volume production combined with capable engineering, reduces costs. You will profit by correct engineering, easier installation, scrap loss elimination and the lower manufacturing cost of the duct and fittings used. Figure all the jobs the Lamneck way.

## DISTRIBUTORS HAVE AMPLE STOCKS TO MEET YOUR IMMEDIATE NEEDS

When you quote on installations, get in touch with your distributor so you can assure your customer the material is in stock, prefabricated, ready to install.

Write us today for the name of your nearest LAMNECK Distributor, who will clearly and concisely explain every detail.



*Specify*

# LAMNECK

**LAMNECK PRODUCTS INC. Middletown, Ohio**

*Simplified Furnace Pipe and Fittings and Prefabricated Duct and Fittings for all Types of Residential Gravity and Forced Warm Air Heating and Air Conditioning Systems.*



# It's 9 to 1 you'll sell **Lochinvar**

**MODEL 80**  
75,000 BTUs  
at Bonnet



**S**INCE 90 per cent of the homes to be built during the next twelve months will sell for less than \$7,000, you will have to choose between shovel service or LOCHINVAR in NINE out of every ten jobs on which you figure. Among progressive dealers everywhere the big swing is, of course, to dependable automatic heat at its lowest cost! That means — to LOCHINVAR!

LOCHINVAR Oil Burning Units are made complete in our plant. That is why they are more satisfactorily designed, are more durable and give better and longer trouble-free service than any other unit of its type on the market.

*Built Around a Marvelous Invention*

## **THE LOCHINVAR BURNER**

(PATENTED)



*Stainless steel casing*



*Horizontal, twin baffles*



*Scientifically placed air-holes*

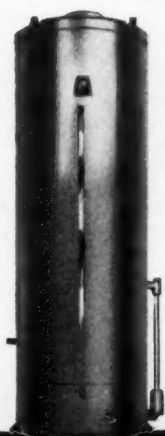


*Low flame—off lower baffle*



*High flame—off upper baffle*

Sizes from 45,000 BTU to 115,000 BTU, including two Hi-Boy models for utility room.



## **LOCHINVAR PRODUCTS**

14247 Tireman Ave., Dearborn, Michigan

Makers of LOCHINVAR OIL HEATING UNITS FOR SMALLER HOMES

*Also America's Fastest Selling Oil Burning Water Heater*

# AMERICAN ARTISAN

Covering All Activities in Residential Air Conditioning and Small Commercial Cooling, Warm Air Heating, Sheet Metal Contracting and Fabricating

WITH WHICH ARE MERGED

**FURNACES  
SHEET METALS**

AND

**Warm-Air  
Heating**

J. D. Wilder, Editor

A. A. Kennedy, Assistant Editor

Vol. 110, No. 5

May, 1941

Founded 1880

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## In This Issue

PICTURES on covers of this issue are typical of activity as the Summer begins. The front cover shows duct systems in a bank job described on page 64 where an outside riser eliminated office disturbance. The attic fan typifies a very active field and the sheet metal shop picture illustrates the nation's great effort to train men in sheet metal work.

Licensing bills are in progress in Michigan, Illinois, Philadelphia. We publish Michigan's proposed bill on page 87. This is only tentative, but shows how Michigan contractors think a state bill should be set up.

Along this same line, and of vital interest to every heating man, is the report of FHA's New Heating Requirements on page 49. FHA has placed these requirements in effect in two insuring offices; if the requirements prove satisfactory they will be put in force all through FHA—with modifications, of course, as needed. We urge a careful reading of this article. You will find many requirements which are good, but not always in keeping with methods the industry has been using.

This month's Air Conditioning Section is full of cooling—a report of attic fan sales in 9 active sales areas; part 2 of the Texas A & M bulletin on attic fans (this chapter covering methods of installing); an evaporative cooling installation in Chicago where evaporative cooling is not always thought of as practicable; and a most unusual duct switchover system in San Antonio where individual offices must be heated when the general office is cooled and vice versa.

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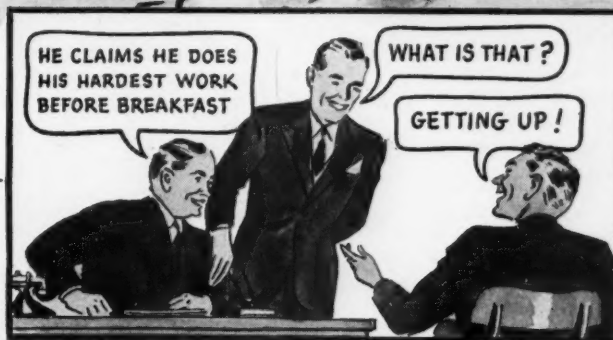
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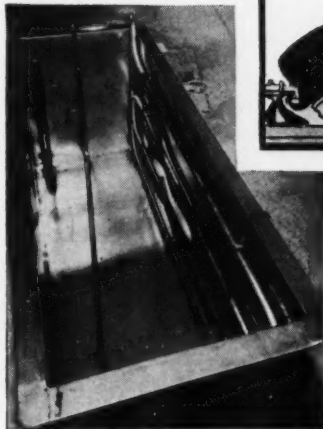
**More than 8,000 copies of this issue are being distributed**



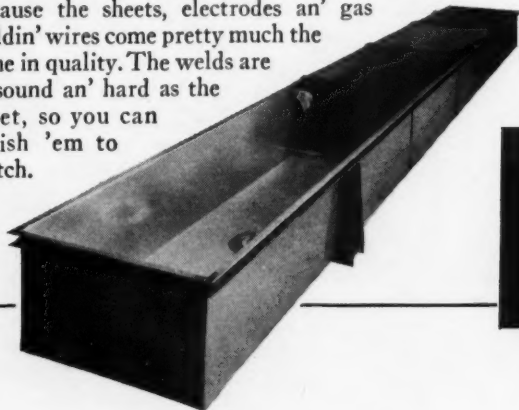
Some of my contractor friends want to know what I mean by "workability." Here's the story:



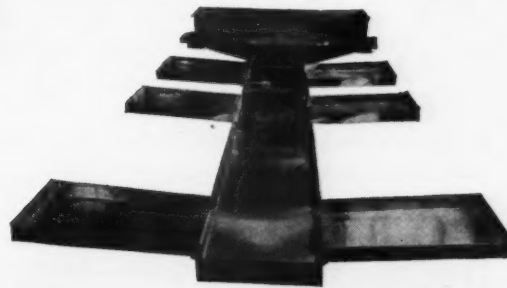
**1.** Different people have different ideas about how easy it is to get out of bed, work a piece of metal, or what have you. But when I talk about Monel bein' easy to work, I mean you can make it into a metal dye tank linin' an' coil like this or any other good-lookin' job, without breakin' your neck or crackin' the metal. I'll tell you some reasons why:



**3.** For weldin' an' solderin' take a look at this dye tank. Atomic hydrogen weldin' was used, except the partitions were soft soldered. (An' you can use silver brazin' with Monel.) Welding Monel is a cinch because the sheets, electrodes an' gas weldin' wires come pretty much the same in quality. The welds are as sound an' hard as the sheet, so you can polish 'em to match.



**2.** Take the set of paper machine pans below, for instance. You can make good time shapin' these trays because Monel doesn't work harden as fast as some metals. It's easy to form an' with mighty few wrinkles... which means quick finishin' as well as formin'. The same applies to makin' seams, includin' lock seams.



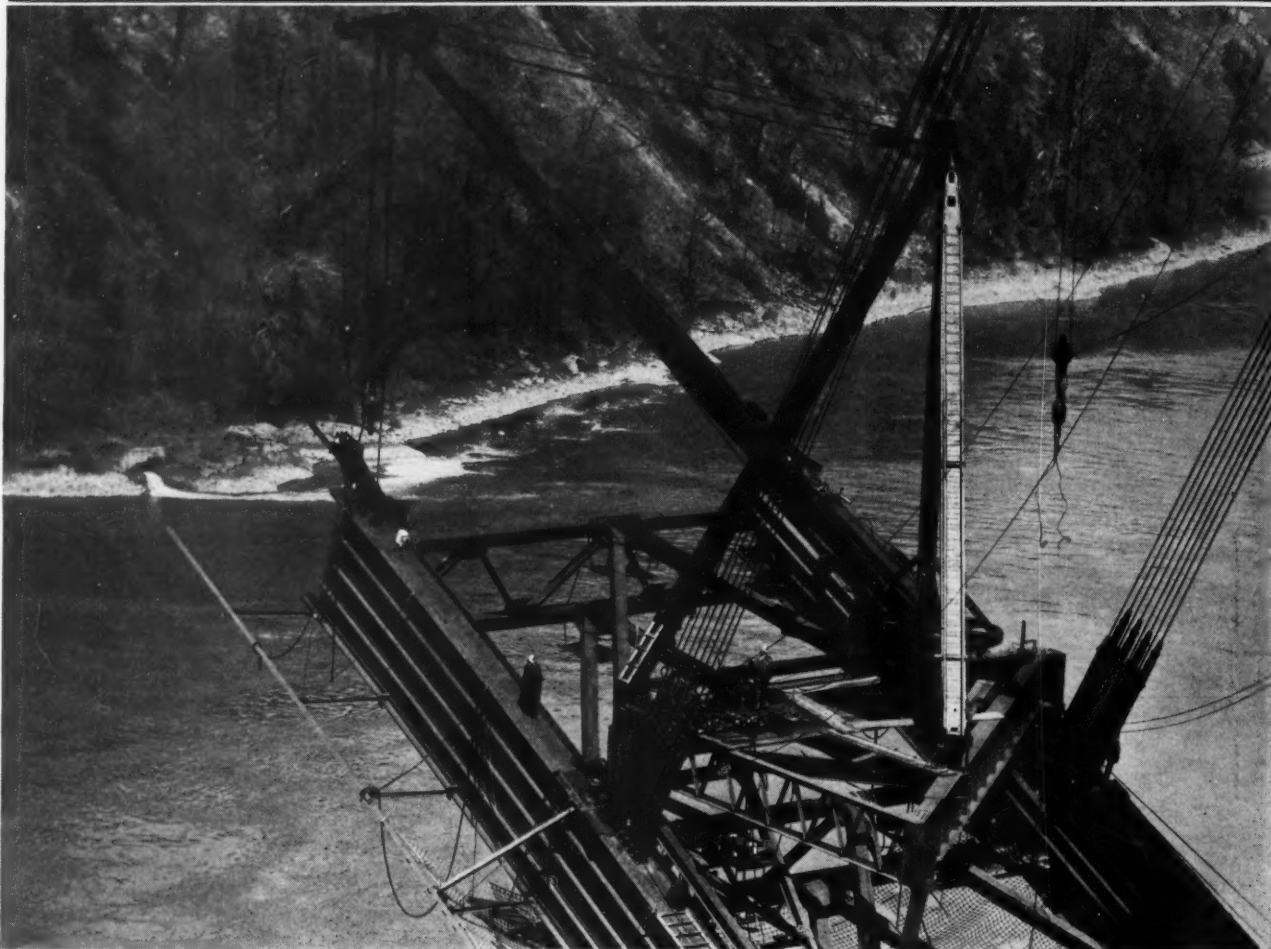
There's plenty of jobs like these in chemical plants an' paper an' textile mills. If you want to know more about gettin' such jobs an' how to handle 'em, just drop me a line. I'll shoot you some useful dope on the different industries an' what they need.

*Tim Shears*

THE INTERNATIONAL NICKEL COMPANY, INC.  
67 Wall Street New York, N. Y.



## Where trustworthy tools are vital

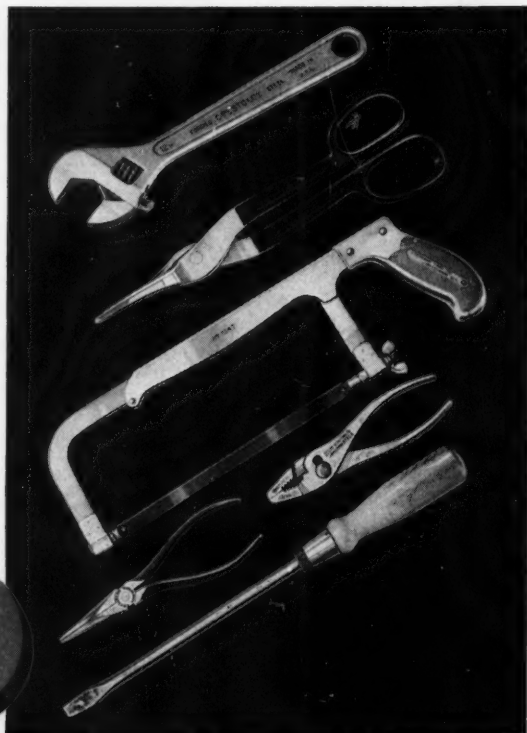


There are hazards enough on jobs like this one, three hundred feet above the roaring Niagara River, without taking chances on inferior hand tools. That's why you see so many Crescent Wrenches swinging from the belts of experienced steel workers as they go about their breath-taking work. And that's one reason why many leading contractors buy Crescent Tools and furnish them to their men. Another reason is because they have learned the outright economy of quality hand tools.

Crescent Tools include adjustable wrenches, pliers of all types, hacksaws, snips, screwdrivers, etc., etc. They are sold under the "Crescent" and "Crestoloy" trade names by hardware dealers and industrial distributors everywhere.

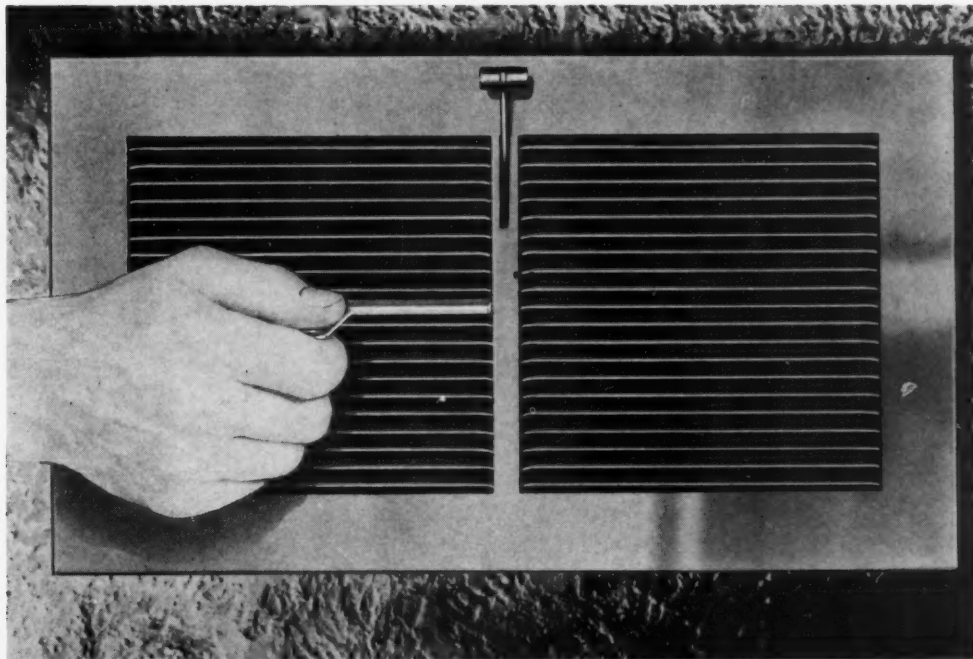
CRESCENT TOOL COMPANY, JAMESTOWN, N. Y.

**YOU CAN ALWAYS DEPEND ON  
CRESCENT TOOLS**



# GIVE YOUR CUSTOMERS A BREAK!

**By Stepping up  
the Efficiency of  
Your Low-priced  
Installations with  
this Outstanding  
Low-cost Register**



## **No. 74 DESIGN** *Flexible Fin* **AIR CONDITIONING REGISTER**

No. 74 Design Registers cost so little more than the very cheapest registers on the market that the difference is practically negligible. But what a whale of a difference in results they produce. Note these pluses:

- ★ **MORE UNIFORM AIR DISTRIBUTION.** With the fins set for downward deflection (as furnished) the tendency of the warm air to rise is counteracted, insuring more uniform air distribution and more even temperature throughout the room.
- ★ **ELIMINATES STREAKED CEILINGS.** The standard setting of the fins is sufficient to prohibit the air flow from striking the ceiling when register is located in high sidewall.
- ★ **ANY DEFLECTION DESIRED, UP or DOWN,** may be had by simply twisting the fins with wrench furnished.
- ★ **EXCEPTIONALLY GOOD APPEARANCE.** Rough edges of fins are entirely concealed—a neat, trim, finished product in every detail.
- ★ **Better results mean greater customer satisfaction and more good will.** Give your customers, as well as yourself, a break by using No. 74 Design registers on all your low-priced installations.

*Current Catalogs: No. 41 (Gravity Registers) and No. 41AC  
(Air Conditioning Registers). If not on hand, write us.*

### **HART & COOLEY MANUFACTURING CO.**

Warm Air Registers • Air Conditioning Grilles • Damper Regulator Sets • Dampers • Chain • Pulleys

HOLLAND



MICHIGAN

Chicago Office: 61 W. Kinzie St.

Philadelphia Office: 1600 Arch St.

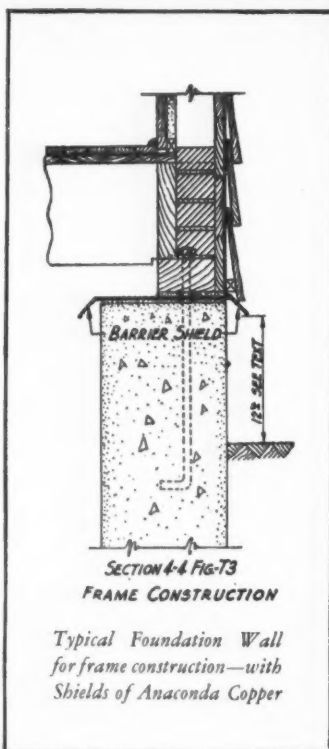


Foundation base with termite shield of Anaconda Copper . . . positive, lasting protection against termite destruction.

# THWART

# RETICULI TERMES\* WITH COPPER

\* Subterranean termites



## Durable copper shields between masonry and wood provide efficient, inexpensive protection against termites

The spread of the wood-eating termite's natural *habitat* has aroused considerable interest . . . particularly in precautionary measures to safeguard building construction against termite damage.

It is generally conceded that properly formed, rustless sheet copper shields offer the most effective and most durable protection. Installation is a relatively simple sheet metal job, the cost being comparable with that of an equal amount of roof flashing.

**Highly Informative Booklet**—The American Brass Company has published a digest of pertinent information on the use of shields for termite protection. A free copy will be mailed promptly on request. 4178

### THE AMERICAN BRASS COMPANY

General Offices: Waterbury, Connecticut

Subsidiary of Anaconda Copper Mining Company

In Canada: ANACONDA AMERICAN BRASS LTD., New Toronto, Ont.



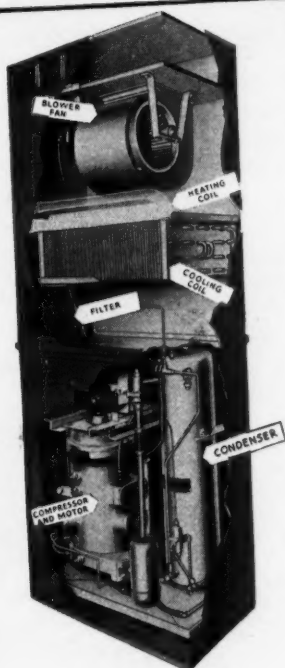
# Anaconda Copper





The dealer selling Airtemp air-conditioning furnaces has an exclusive sales argument. Buyer can install an Airtemp furnace and at any time add the cooling unit at modest cost for year-'round air conditioning.

# Chrysler Airtemp Dealers MAKE MONEY SELLING PACKAGED COOLING



Three h. p. cooling unit for stores, offices and restaurants. Exclusive radial compressor is hermetically sealed with motor in bath of oil. Five h. p. model, same design, for larger spaces. Warranted by Chrysler Corporation. Startlingly low prices!

**Cooling Market Enormous**—The market for summer cooling units—for homes, offices, stores, restaurants, etc., is tremendous. Sales this year will hit an all-time high. The public is learning that summer air-conditioning is practical, efficient. People expect public places to be cool in summer, are beginning to want their homes cool, too.

**Profitable Volume**—Only about one business place in 10 has summer cooling. The other 9 want it! Airtemp cooling units are easy to sell—both in combination with air-conditioning furnaces for the home, or separately for cooling offices, stores and other business places.

**A Deal For Dealers**—To introduce its packaged cooling line, Airtemp has a special deal—for a limited time only—covering its complete line of packaged cooling units from  $\frac{1}{3}$ ,  $\frac{1}{2}$  and  $\frac{3}{4}$  h. p. room coolers to its big 3 and 5 h. p. units for large spaces. Send today for complete details.

## CHRYSLER AIRTEMP

AIRTEMP DIVISION, CHRYSLER CORPORATION, DAYTON, OHIO

**MAIL THIS  
COUPON TODAY**

Airtemp Division  
Chrysler Corporation, Dept. 1  
Dayton, Ohio

Gentlemen: Send me complete information on your combination unit and special proposition on packaged cooling units.

Name

Address

City  State

# RYBOLT

## TODAY THERE'S A 4-LANE HIGHWAY TO *Automatic Heating Sales*

•The road to automatic heating sales has been widened and improved considerably in the last year or so. Today it is a smooth, high speed highway with four lanes leading to an immense and active market.

The first lane is the big increase in homes now being built. Estimated at 650,000 for 1941, this increase in new homes naturally indicates larger potential sales of heating units. The second lane lies in the fact that more reasonable prices and easier deferred payment plans now bring automatic heating within reach of the low cost home owner.

The third lane is in the present day universal demand for greater convenience and comfort—a sales factor that in many cases far outweighs considerations of price. The fourth lane, which has greatly speeded up traffic toward automatic heating sales, is the largely increased buying power which now enables all classes of people to consider buying what they *want* rather than merely what they *need*. For the dealer with the RYBOLT Complete Line there is no speed limit on this road to bigger business.



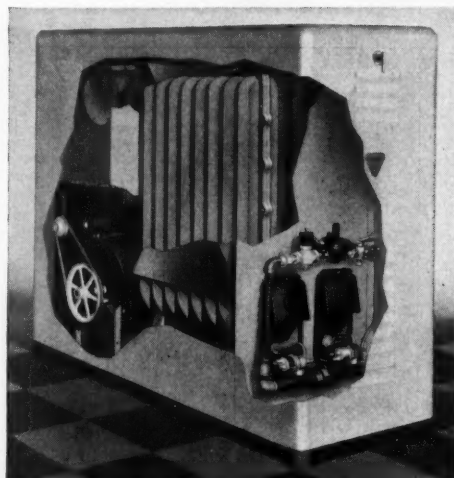
### RYBOLT CAST IRON GAS-FIRED Winter Air Conditioner

**Series CG** This RYBOLT Cast Iron Gas-Fired Winter Air Conditioner represents a completely new design embodying approved engineering principles of modern gas heating. It has a combustion chamber of durable gray iron castings of uniform thickness. Special flue economizer and scientific baffling promote economy of operation. Projecting into the return chamber the flue economizer serves as a pre-heater, thus saving fuel. Because of its large volume of iron the heating element holds heat for a long time, guarding against rapid temperature changes. Cabinet finished in smooth gray Hammerloid enamel with black base, is inner-lined with a sheet metal baffle. Sturdy, simple and accessible to service. 5 sizes.



TRADE MARK

WRITE FOR set of folders covering the complete RYBOLT line of Winter Air Conditioners and Warm Air Furnaces.



**THE RYBOLT HEATER COMPANY**  
**615 MILLER STREET • ASHLAND, OHIO**



*How many  
humidifier pans are  
just "BAKING PANS"?*



**D**URING the past year we've asked that question more than once when we saw what had happened to the humidifier pans of warm air furnaces. We've looked at furnace after furnace, and we've seen valves plugged up—valves stuck open—valves to which the water supply has been cut-off long ago, converting the best feature of a warm air furnace into just a baking pan. You've seen it too, of course; so there can't be any doubt in your mind that a dependable valve to maintain the water level in the humidifier pan is one of your greatest needs *right now*.

The only question that remains to be settled is whether we have built that kind of valve, and if you will look at the No. 217 and its record we believe you will agree that we have. When you look at the valve you see an *engineered device*—all our unequalled experience in water level control in a valve that makes humidification unailing. It has no slightly cracked position, and therefore it gets away from the seeping or dribbling condition that has caused so much trouble in valves of this kind.

#### Snap Action Does the Trick—

Instead, it has an ingenious snap action. It is designed to stay tight-closed until the water level in the pan drops a quarter-inch; then it snaps wide open—opens up a full stream that sluices away dirt and lime that would plug other valves—passes a full stream that quickly restores the water level in pans of any size. When the water level is restored, it closes with the same sure-footed snap—absolutely leak-tight against any city pressure clear up to 150 lbs.

And look at its record too. In one year it has passed the rigid tests of engineering departments and received the stamp of approval of a long list of furnace manufacturers. Included in the list of 27 manufacturers who are now using McDonnell Humidifier Valves are such names as Lennox, Round Oak, Iron Fireman and H. D. Little.

► All around you are jobs that need this valve. Specify it on new furnaces—use it to clean up troubles on the old ones! The whole story is told in an interesting bulletin. Write for it.

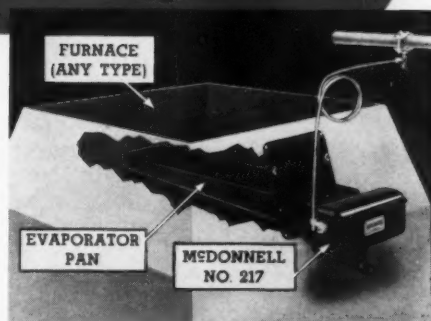
**MCDONNELL & MILLER, 1318 Wrigley Bldg., Chicago, Ill.**



© M & M

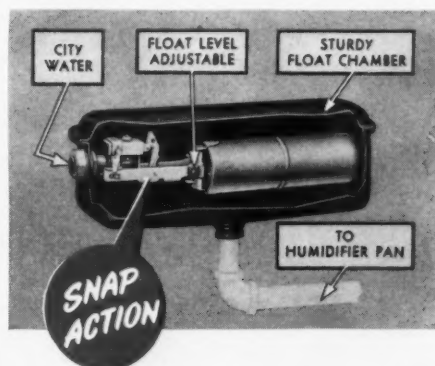
# MCDONNELL

*Humidifier  
Water Controls*



**ON ANY FURNACE—**The McDonnell Humidifier Water Control will do a better job of maintaining the level in the pan. A typical application is shown above. The valve is available as:

- No. 217 Complete, with copper tubing and fittings as shown below.
- No. 117 Same as No. 217, but without tubing and fittings.
- No. 17 Valve and float only (without float chamber).



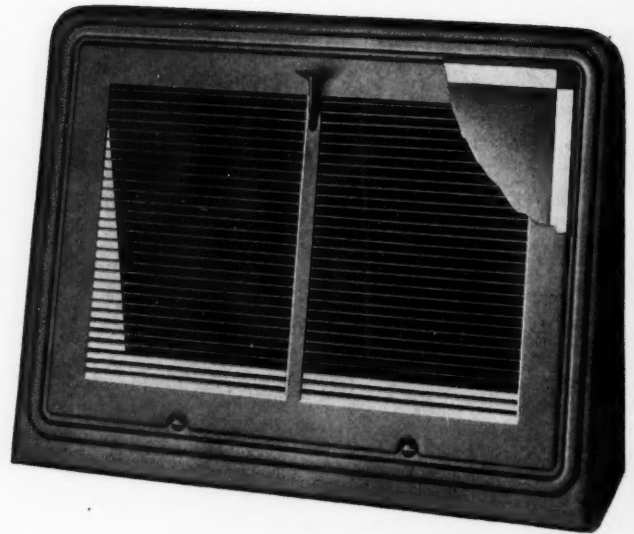
● When you look at this automatic valve you'll marvel that a device so well made can be sold at such a low price. The valve is machined from bar stock; the seat is an all-but-indestructible alloy; a typical refinement is built-in strainer ahead of the valve. The extra-value features are made possible by elaborate tooling. They are extra dividends to you and your customer.

**YOUR JOBBER  
STOCKS THEM**



## Why The U.S. "40" Series Excels for Gravity Installations

The Straight Set Bars conceal interior view. Two-piece construction creates PERFECT SEAL that prevents leakage. LOWEST Resistance—Maximum Free Area. Metalac Finish (at Black Japan Cost) is superlative. 40 Series is definitely a Line to Stock.

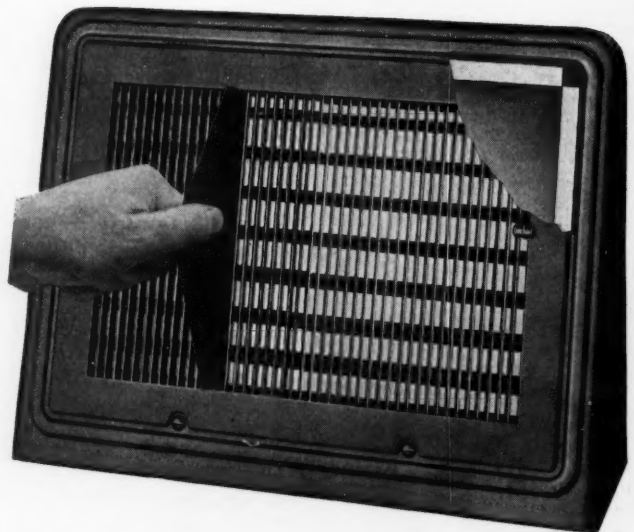


## U.S. Springs the "BEST YET" the No. 30

**NEW!**



A definite Conversion Baseboard Register. Grille Bars may be set to any angle of Side Flow Required. Horizontal Multiple Back Valves direct the Air Flow to any up and down flow.



You can swing any Conversion Job Your Way with the NEW No. 30 LINE of U. S. Baseboard Registers. No. 230 U. S. Sidewall Register and No. 240 U. S. Sidewall Register are the corresponding matching designs for above-baseboard installation.

Send for Latest No. 41 A-C Air-Conditioning Catalog. Visit our booth, No. 922, at Pacific Heating and Air Conditioning Exposition.



# UNITED STATES REGISTER CO.

BATTLE CREEK, MICHIGAN

MINNEAPOLIS • KANSAS CITY • ALBANY • SAN FRANCISCO • NEW YORK, N. Y.

CANADIAN MANUFACTURING DISTRIBUTORS — Canada Register & Grille Co., Ltd., Toronto. Ontario

# NEW "Package" AIR CONDITIONER FOR EVEN THE SMALLEST HOMES

## *Rated 70,000 B.T.U.*

### OPENS VAST NEW MARKETS IN "DEFENSE" AND OTHER SMALL-HOME BUILDING

Here's the Air Conditioning Furnace which puts Air Conditioning into the mass-profit, small-home field. This Unit is delivered completely assembled—ready to hook up and operate. Yes, the new RU-7 cuts installation costs to the absolute minimum, and its 70,000 B.T.U. bonnet rating makes it ideal for the small one or one-and-a-half story, 4 to 5-room home. Because it occupies so little space (only 20" by 20" floor space) it's just the thing for cellarless homes. The Fluid Heat RU-7 is *complete*—it heats, circulates, humidifies and filters the air—does anything larger units can do. It's *priced low* to sell in quantities, too!

Hundreds of these new air conditioner units have already been sold, even before any public announcement has been made. Today they're rolling down the Fluid Heat production line in quantities to meet a demand which is expected to top all previous records in the air conditioning field. Get on the Fluid Heat Band-Wagon now. Get the facts about this amazing Unit, and the Fluid Heat 100% complete line—now.

### YOU'RE NEVER "OUT-IN-THE-COLD" WHEN YOU HANDLE THE FLUID HEAT LINE

*... A Unit for Every Prospect*

4 Pressure Burners • 6 Rotary Burners • 1 Domestic Hot Water Heater • 8 Winter Air Conditioners • 3 Burner Boiler Units.

## **fluid heat** AIR CONDITIONER

*"World's Economy Champion"*

A PRODUCT OF THE ANCHOR POST FENCE COMPANY,  
BALTIMORE, MD., ESTABLISHED 1892

### FOR ACTION—MAIL TODAY!

FLUID HEAT DIVISION, Anchor Post Fence Co.  
6730 Eastern Ave., Baltimore, Md.

Please rush details of the new Fluid Heat RU-7 and the Fluid Heat line.

Name.....

Firm.....

Address.....

City..... State.....

### COMPARE THESE QUICK-PROFIT FEATURES!

1 Delivered completely assembled including Refractory

2 P-3C Fluid Heat Burner

3 7/10 GPH Firing rate

4 Spun Glass Filters

5 Scientifically designed copper-bearing steel furnace with 22½ sq. ft. of heating surface, electrically welded throughout

6 Flue over burner to conserve space. Low stack temperature

7 Steel Insulating Linings

8 Rustproof Humidifier, Automatic Float Control

9 9-inch Blower Wheel

10 Rubber-mounted Motor

11 Underwriter-approved burner and controls

**WHAT WE CAN LEARN  
FROM THE  
THREE-LEGGED STOOL**



Back in school we learned that three points—no more, no less—adjust themselves perfectly to any plane whatsoever. That is the reason the stool with three legs sits firmly on any floor anywhere without rocking.

*Moncrief's  
Three-Point Line*

Moncrief Winter Air Conditioners for burning any of the three fuels—gas, coal or oil—give you a perfect set-up for selling any prospect.

You can satisfy every requirement of the man who wants the very best the market affords—the latest in engineering design, with every accessory to promote comfort and convenience, the finest in styling and topmost in quality and workmanship.

Then there are units for those who demand quality at a more moderate price; and specialized types for low cost homes where both space and budgets are limited.

*Moncrief's  
Three-Point Value*

Here they are—Quality, Style and Fair Price. These added up spell Value—value you will not find eclipsed in any other line under the sun. It is this 3-point value that gives Moncrief dealers the edge on any situation that confronts them.

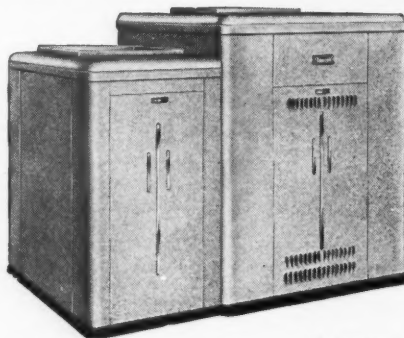
*Moncrief's  
Three-Point Policy*

It has been progressively found that our Manufacturer-Jobber-Dealer Policy works to the mutual benefit of all. You, the dealer, are relieved of carrying large stocks, service is quickened and costs are lowered. Everybody wins with Moncrief's 3-Point Policy of distribution.

Note: We would like to put you in touch with the Moncrief Jobber nearest you.

# MONCRIEF

## *Oil-Fired* **WINTER AIR CONDITIONERS\***



Aristocrat



Special

## *3 Top Flight Units*

**THAT**

## **MEET EVERY DEMAND**

Big home, small home, high quality or low price—whatever your customer's requirement, you have a Moncrief oil-fired unit that gives him just what he is looking for. These units are specially designed to team up with any standard burner and perform with the fullest degree of efficiency and economy. Remember, Moncrief also makes winter air conditioners specially designed to burn coal or gas.

\*Burners not included.

Refer your layout and estimating problems to Moncrief Engineering Department. The service is free to Moncrief Dealers.



"55" Utility

*Moncrief  
Aristocrat  
Features*

- Beautiful finish.
- Heating unit sturdily built, permanently gas tight.
- Extra long fire travel radiator.
- Cabinet has dust-tight floor.

Send for illustrated literature and prices.

## **THE HENRY FURNACE & FOUNDRY CO.**

3473 E. 49th STREET, CLEVELAND, OHIO



*Complete Line*  
CAST and STEEL FURNACES  
WINTER AIR CONDITIONERS

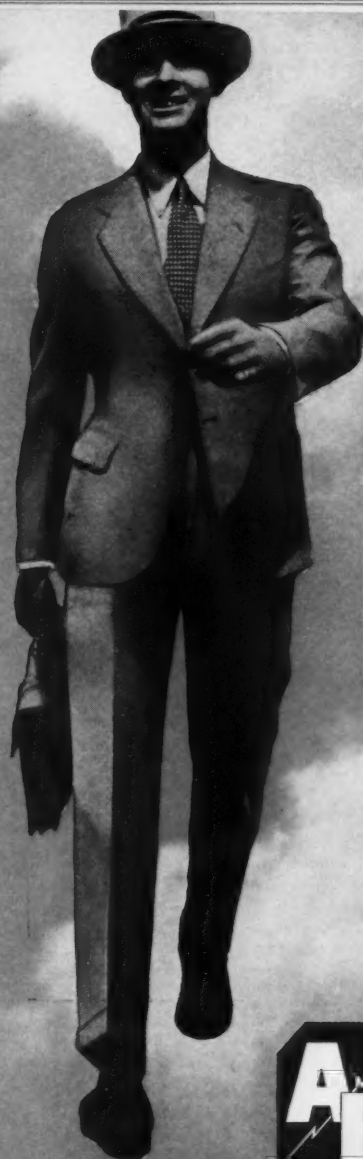


# American Blower DEALERS

*are walking  
on air!*

It's Comfort Cooling—and Electric Ventilation time... Business is booming with American Blower Dealers not only because they sell the most complete line in the industry, but also because American Blower products are recognized everywhere for their quality, dependability and extra value. (They can be sold on F. H. A. Pay-by-the-Month Plan through The Heating and Plumbing Finance Corp.)

Then, too, American Blower's colorful, effective, direct mail, magazine and newspaper advertising campaigns and dealers' sales helps are already at work, creating sales, bringing prospects in to authorized American Blower Dealers. If you are



active, energetic and want to make real money selling Comfort Cooling and Electric Ventilating Equipment, investigate the American Blower franchise TODAY. Get in this permanent, profitable business NOW. Mail the coupon, ask your jobber, or phone the nearest American Blower Branch Office today.

## AMERICAN BLOWER

AMERICAN BLOWER CORPORATION, 6000 Russell Street, Detroit, Mich.  
Division of American Radiator and Standard Sanitary Corporation  
In Canada: CANADIAN SIROCCO COMPANY, LTD., Windsor, Ontario

*Mail coupon NOW*

Please send a copy of your new 1941 Sales and Advertising Plans to:

Name \_\_\_\_\_  
Firm Name \_\_\_\_\_  
Street \_\_\_\_\_  
City & State \_\_\_\_\_



MINNEAPOLIS  
-HONEYWELL  
*IS Selling*  
AUTOMATIC HEATING  
FOR YOU  
WITH 677,000,000  
MAGAZINE and BILLBOARD  
MESSAGES

A TWO STAGE  
CONTROL  
PACKAGE THAT PRODUCES  
*Leveled Heat*  
FOR  
HAND FIRED FORCED  
WARM AIR SYSTEMS

HERE is a control package that goes a long way toward leveling room temperatures on a coal fired job. On a slight drop in room temperature, a two-stage thermostat operates the blower,—only if the bonnet temperatures are warm enough,—without disturbing the fire. This blower operation will frequently bring the room temperature up to the thermostat setting. If the thermostat does not become satisfied, and a slight further drop in room temperature takes place, the furnace dampers are then operated to accelerate the fire. When the room temperature begins to rise a fraction of a degree, the first operation of the two-stage thermostat closes the draft damper but permits the fan to run until the second operation of the thermostat stops it when the room temperature is back up to thermostat setting.

This control system utilizes the heat in the bonnet of the furnace at the beginning of the operation without disturbing the fire, and checks the fire without stopping the blower sometime before the room thermostat is satisfied. Thus, overshooting of room temperatures, so common in coal fired forced warm air furnaces, is eliminated with consequent material fuel savings and greatly increased comfort conditions. The price is surprisingly low. Minneapolis-Honeywell Regulator Co., 2726 4th Ave. So., Minneapolis, Minn. Canadian Plant Toronto, European Plant London. Company owned branches in 48 cities.

**MINNEAPOLIS-HONEYWELL**  
CONTROL *Systems*





## DID WE HEAR YOU SAY YOUR SHOP WAS TOO SMALL FOR A **LOCKFORMER?**

*"Let's take a minute to check the figures . . ."*

In the first place, we're going to assume that you erect at least 12,000 pounds of metal per year. (Most sheet metal men agree that any shop dependent primarily upon duct work must do at least that much erection in order to remain in business.)

Figured conservatively, Lockformers save an average of  $2\frac{1}{2}c$  per pound of metal handled, and this figure, times the poundage mentioned above, means a savings of \$300.00 per year—or a monthly savings of \$25.00. And, at \$25.00 a month, it would take just  $6\frac{1}{2}$  months for the Lockformer 24 to pay for its own cost of \$163.00.

***LBS.  $\times$   $2\frac{1}{2}c$  = SAVINGS***

Lockformer savings are actually just as simple as that—just as easy to figure. And if there's any doubt in your mind as to the  $2\frac{1}{2}c$  per pound figure, we'll be glad to substantiate it with records sent us by actual users as well as by demonstration in your own shop.

***One Man and a Lockformer Can Make More Pittsburgh Locks Than Sixteen Men Working at Eight Brakes . . .***

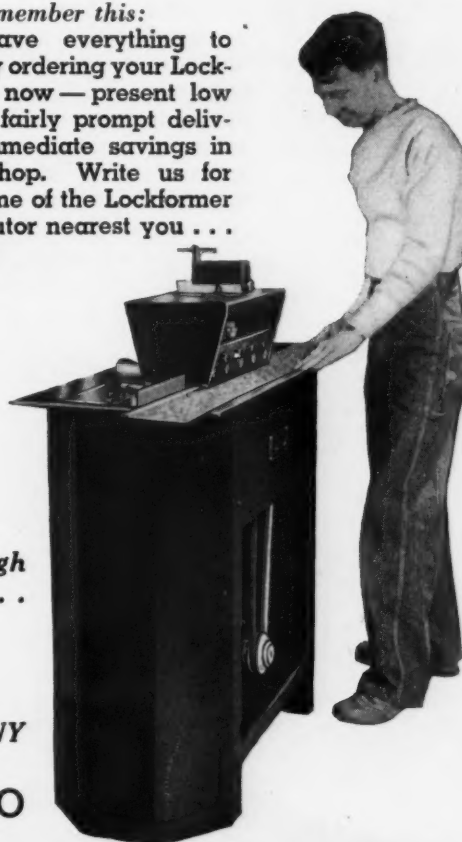
**THE *LOCKFORMER* COMPANY**

**4615 Arthington St.**

**CHICAGO**

Savings effected in larger shops, naturally, are much more impressive. But the fact remains that **NO SHOP IS TOO SMALL FOR LOCKFORMER EFFICIENCY.** Because this fact is becoming increasingly accepted, Lockformer sales, for 1941, are more than three times those of the same period in 1940; 1940 sales were just about double those in 1939.

*And remember this:*  
you have everything to gain by ordering your Lockformer now—present low prices, fairly prompt delivery, immediate savings in your shop. Write us for the name of the Lockformer Distributor nearest you . . . today!







It's a swell feeling when everybody wants to buy something from you. Well, why not have that feeling? . . .

It's a cinch to get a whale of a lot more Spring and Summer business from forced warm-air furnace owners. All you have to do is: USE the NEW Dust-Stop sales helps. They won't cost you a cent!

**THESE SALES HELPS GET THE BUSINESS!**

They're a set of two postcards, designed to get you inside your prospect's home. They sell the prospect on the idea of a furnace checkup, plus new Dust-Stop Filters for better Summer ventilating. This idea has worked like magic before, and there's no reason why it can't

work like magic for you—IF YOU'LL LET IT!

**THEY'RE FREE! FREE! FREE!**

You don't pay for your set of cards. Dust-Stop gives them to you with no strings attached. What's more, you get your name, address, and telephone number printed on each card. Free.

But there's no time to lose . . .

Fill out the coupon now, before you turn this page. Send it on to us . . . and by return mail you'll get your set of cards. Start the ball rolling now for INCREASED business! Make this Spring pay you more money than ever! Owens-Corning Fiberglas Corporation, Toledo, Ohio.

**FREE! FREE! FREE! FREE!**

OWENS-CORNING FIBERGLAS CORPORATION  
Dept. A, Toledo, Ohio

Gentlemen: Please send me FREE HOW MANY? sets of postcards (2 to a set) imprinted with my name as follows:

NAME \_\_\_\_\_

STREET \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_

PHONE NO. \_\_\_\_\_

YOUR JOBBER'S NAME \_\_\_\_\_

JOBBER'S ADDRESS \_\_\_\_\_

**IMPORTANT: IF YOU BUY FROM A JOBBER, BE SURE TO FILL IN HIS NAME AND ADDRESS**

*Now* ... You can get more of the desirable, profitable automatic heating jobs

**MUELLER** *Milwaukee*  
P R E S E N T S

# A New Vertical Oil-Fired Winter Air Conditioner

... for the moderate-priced small-home market



*Styled by  
Brooks Stevens*



## Equipped with the MUELLER Vaporizing Oil Burner

Air for combustion is supplied from a mechanical blower. Burner is fully enclosed but readily accessible for servicing. Safety float control.

## Coming—series OHP Horizontal Oil-Fired Winter Air Conditioner

A companion unit to the OVP Vertical. The OHP fits in basements with lower headroom — where floor space is not an important consideration.

**Built to the quality standards of a nationally known, nationally advertised brand—for economical operation, long life, genuine satisfaction of users**

In a field where price has too often outweighed other considerations, you are now able to offer a moderate-priced unit that is really engineered to do an efficient heating job — the new Mueller OVP.

This new Mueller furnace has plenty of heating surface for efficient operation and effective heat transfer—without costly waste up the chimney or overheating of the drum. 80,000 B.t.u. output rating at the bonnet. Readily cleanable to maintain efficiency.

The Mueller Vaporizing Oil Burner puts this unit in a class by itself. Variable in capacity from 10% of maximum up to maximum, just by turning a dial — for more satisfactory, economical operation in mild weather.

Good-looking insulated casing —

substantial appearance and construction. Completely equipped with air filters, automatic humidifier, circulating fan, etc. Adaptable to basement or utility room installation — low overall height . . . flue pipe connects on either side . . . filters installed in either bottom or side. With the Mueller Series 50 Oil-fired Winter Air Conditioner — equipped with either the Mueller Vaporizing Burner or the Mueller Pressure Atomizing Burner — the new Series OVP and OHP give you a complete line "sized" for efficient operation in the home where you install it . . . For a big season, get "into the money" with Mueller. Write for literature. L. J. Mueller Furnace Company, 2010 W. Oklahoma Ave., Milwaukee, Wis.

D-9A

**MUELLER** *Milwaukee*  
HEATING AND AIR CONDITIONING

*Here's New*  
**BEAUTY**



**T**HE sleek modern appearance of today's air conditioning registers is now applied to a gravity register—the Auer Heat-Rite. Here is a design which you can use for modernizing existing installations, because outside dimensions are the same as other Auer baseboard models, and thus interchangeable. Of course, there is nothing finer for use on your new jobs as well.

The Heat-Rite has a fin type face, with slightly downward directional fins, ideal for most purposes, but adjustable for other levels if necessary. Open area is carefully calculated and abundant. The Heat-Rite series is made in both 1 and 2 piece types for baseboard, also in wall registers and baseboard intakes. Offered in Auer's new DuraTone lustrous metallic finish, in addition to all standard finishes—at prices no different than ordinary gravity registers.

For new beauty, value, efficiency—be sure to see the new Heat-Rite!

A request from you brings complete new Auer Register Book 41, showing all models for air conditioning and warm air. Special Grille Catalog "G" also available.

**THE AUER REGISTER CO.**  
3608 Payne Ave. CLEVELAND, OHIO

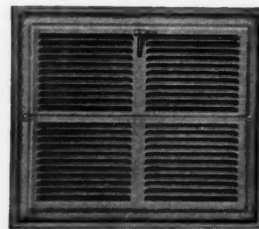


Fig. HB—Heat-Rite Wall Register

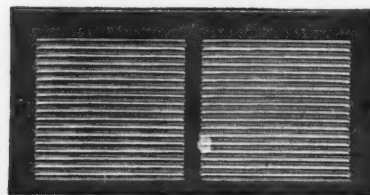


Fig. HG—Heat-Rite Intake for Baseboard

**AUER**  
**HEAT-RITE**  
*Registers*



*Presenting a Great New*  
**SUNBEAM**

*GAS-FIRED WINTER AIR CONDITIONER*

*the*  
**MOHAWK**  
*in*  
**TWO-TONE**  
**PLACID BLUE**



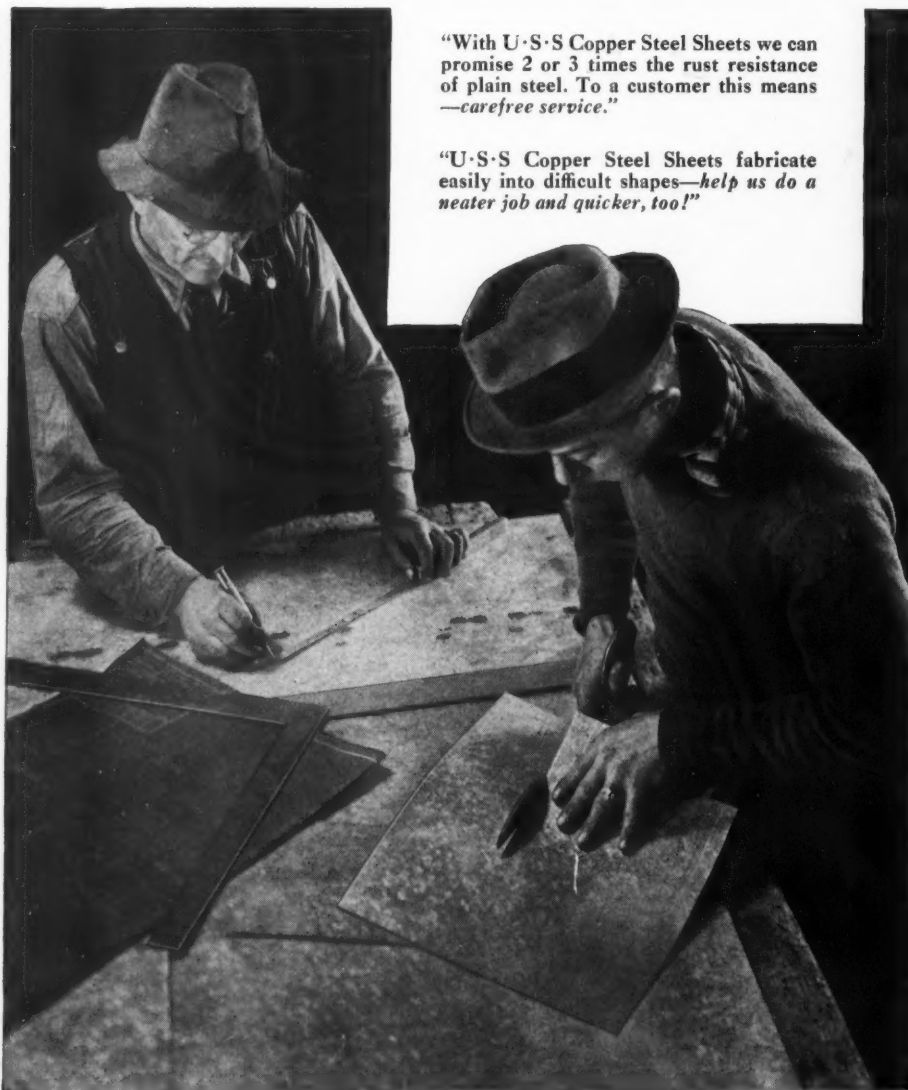
IT IS WITH great pride that we present this newest member of the famous SUNBEAM family. And we believe you will acclaim the new Mohawk Gas-Fired Winter Air Conditioner when you examine its excellent features, and see the beauty of its Two-Tone, suede texture Placid Blue jacket that has gently rounded corners and a distinctive nameplate. Modest in cost, the Mohawk has a rugged cast iron heating element and is available in nine sizes, from 60,000 to 300,000 B t u input per hour. Its special ribbon-type burner assures a satin-smooth, uniform flame that burns natural, manufactured, mixed or bottled gas dependably, sparingly and quietly. Write to us today for colorful literature, and for facts about our special Summer Finance Plan for modernizing, plus the name of the SUNBEAM Jobber nearest you.

**AMERICAN**  
HEATING EQUIPMENT  
COSTS NO MORE THAN OTHERS

**AMERICAN** & **Standard**  
**RADIATOR** & **Sanitary**  
*New York CORPORATION Pittsburgh*

Copyright 1941, American Radiator & Standard Sanitary Corporation

# ASK THE MEN WHO WORK WITH THEM . . .



"With U·S·S Copper Steel Sheets we can promise 2 or 3 times the rust resistance of plain steel. To a customer this means—carefree service."

"U·S·S Copper Steel Sheets fabricate easily into difficult shapes—help us do a neater job and quicker, too!"

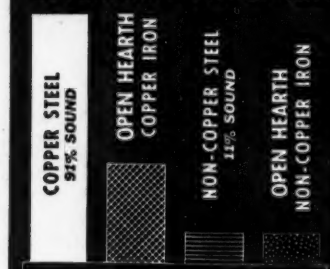


**T**HE men throughout the metal working industry enthusiastically endorse U·S·S Copper Steel Sheets—all for the same reasons! The high quality of longer-lasting U·S·S Copper Steel Sheets is standard—every sheet is uniform in gage, size and working qualities. Ask the men who figure the jobs—they'll all agree U·S·S Copper Steel gives them a *plus selling value!* Extensive tests, supervised by the American Society for Testing Materials over a period of 21 years, proved that Copper Steel lasts more than twice as long when

exposed to atmospheric conditions than other comparable materials. Yet the cost is low enough that you can use U·S·S Copper Steel Sheets on every job, large or small.

If you want to build a reputation for installations which give your customers the best insurance against frequent replacements, or repairs on ducts, housings, heating systems, roofing and siding, downspouts and flashings — specify U·S·S Copper Steel Sheets on your next job. Write for our booklet on U·S·S Copper Steel for helpful information.

**HERE'S THE PROOF!**  
**UNCOATED COPPER STEEL**  
**91% SOUND AFTER 21 YRS.**



This chart compiled from inspection reports of the Committee on Corrosion of Iron and Steel, A.S.T.M. Proceedings 1937, shows results of tests carried on at Annapolis, Md. from 1916 to 1936. After 21 years' exposure, 91% of COPPER STEEL sheets remained "sound" (unperforated). Other materials were decidedly inferior.



## U·S·S COPPER STEEL SHEETS

CARNEGIE-ILLINOIS STEEL CORPORATION, Pittsburgh and Chicago

COLUMBIA STEEL COMPANY, San Francisco

TENNESSEE COAL, IRON & RAILROAD COMPANY, Birmingham

Scully Steel Products Company, Chicago, Warehouse Distributors • United States Steel Export Company, New York

# UNITED STATES STEEL

*Here's another  
plus feature in the*

## FITZGIBBONS DIRECTAIRE · CONDITIONER



**Fitzgibbons  
WELDSEAL CONSTRUCTION**

**NO CHANCE FOR LEAKS** in this one-piece conditioner! The gases or dust of combustion cannot possibly contaminate the clean air stream. All joints are made positively **gas-tight, dust-tight, air-tight** by Fitzgibbons Weldseal construction—an approved method of electric welding that makes the basic unit practically jointless! This welding process is possible, because the stock to be joined is 7-gauge steel plate — much stronger and heavier than is usually used in building conditioners. This steel, incidentally, has an admixture of copper, to neutralize possible corrosion.

**Exclusive Sales  
Franchises  
Open —  
Mail this  
coupon Today!**

### SELL LIFETIME AIR CONDITIONING

in the solidly-built, eminently substantial Fitzgibbons Directaire. Sell **ECONOMY**, too—for this unit has every Fitzgibbons fuel-saving feature. Sell **ADAPTABILITY**, in the six Directaire sizes, suitable for any home from the small basementless cottage to the largest residence.

**Fitzgibbons Boiler Company, Inc.**  
101 Park Avenue, New York, N. Y.

AA-5

Send me details of Franchise and Catalog Data of the DIRECTAIRE.

NAME..... COMPANY.....  
STREET..... CITY..... STATE.....





## THE OLD TIME FAVORITE "TIN ROOF" *is coming back into style*

For more than 200 years, terne plate has been proving its usefulness and economy as a roofing material. Roofs built of Taylor Ternes during the last century are still giving excellent low-cost service.

Today, architects are using ternes to get long sweeping roof line effects—to bring bright colors to roofs. Contractors are specifying it for both low cost and the more pretentious homes. Owners, remembering the experience of their parents, are easy to sell on its beauty, its low first cost, its low maintenance expense.

You can reap the profits from this trend back to "the tinner's roof" by using Republic Taylor Ternes—copper-bearing steel coated with a lead-tin alloy—weather-resisting—and long-lasting.

Available in sheets and rolls and with several weights of coating—including that best known of all brands—Target and Arrow. Stocked in all large cities for your convenience.

### REPUBLIC STEEL CORPORATION

General Offices: Cleveland, Ohio

BERGER MANUFACTURING DIVISION • CULVERT DIVISION • NILES STEEL PRODUCTS DIVISION  
STEEL AND TUBES DIVISION • UNION DRAWN STEEL DIVISION • TRUSCON STEEL COMPANY

### A TAYLOR TERNES

**ROOF** was applied to the Curtis Hotel, Lenox, Mass., about 1897. A letter from the management in 1940 reads—"Taylor Ternes Roofing has proved to be very practical and economical. The upkeep has been extremely small. The roof is still going strong."



### THIS BOOK WILL HELP YOU GET MORE ROOFING BUSINESS

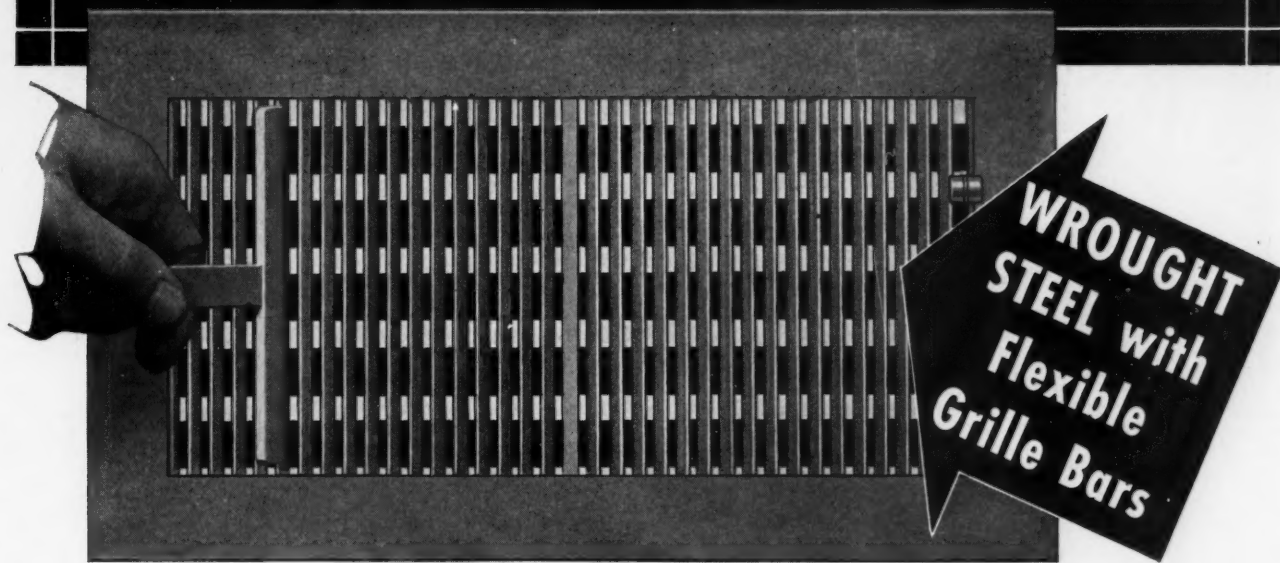
Read all about Republic Taylor Ternes in Booklet 365—their advantages, arguments that will help you close sales, their forms, sizes, gauges and methods of application. Write today for your copy.

## REPUBLIC TAYLOR ROOFING TERNES

FLAT SHEETS—PAINTED OR UNPAINTED ROLLS—SIX WEIGHTS OF  
COATING TO SELECT FROM—AND TARGET AND ARROW BRAND

# INDEPENDENT

## *Air Conditioning Registers*



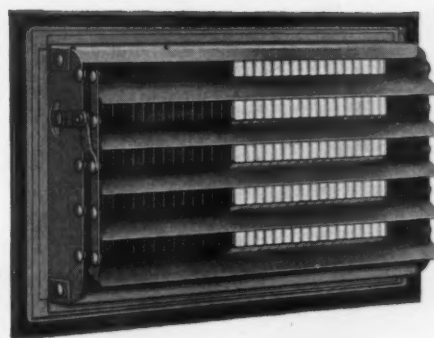
### No. 238 Gives *Four-Way* Direction to Air Flows

*Always Leading...  
Always Progressing*



• This modern register gives the widest latitude in directing air flows. It is quality made in every particular, presents fine appearance, and is not high priced. The vertical grille bars are flexible and are regularly set, one half to direct air flow 30 degrees to the right, the other half 30 degrees to the left. With a tool accompanying each shipment, they may be reset all to the right or to the left, or to any other angle, or

*Rear view  
showing  
multiple  
valves*



to give straight outward flow. Multiple valves at the back, governed by a simple, concealed, non-tamperable device, may be adjusted to give upward, downward or straight outward direction to air flow, or closed to stop air flow entirely. Send for catalog.

## THE INDEPENDENT REGISTER CO.

3747 EAST 93RD STREET, CLEVELAND, OHIO



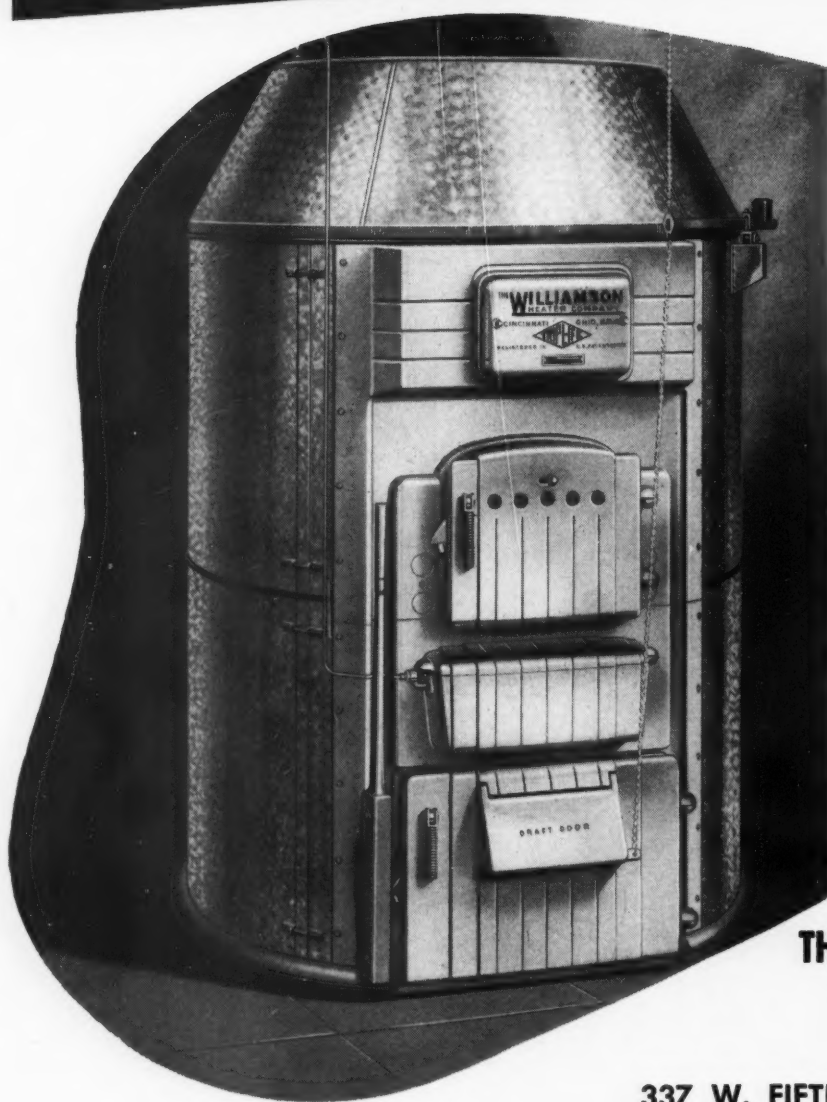
THE

NEW

presenting

**WILLIAMSON**

TRIPL-IFE FURNACE



Thousands of home owners have told us... "Why they are proud to own a Williamson Tripl-ife Furnace." Not only are they proud of the comfort they enjoy but they are equally proud to show it to their friends.

Now... The New Williamson Tripl-ife Furnace has been redesigned... for greater beauty, greater heating capacity and for greater pride of possession.

... and the dealer will take pride and profit from selling it.

Your request will bring complete information; address department 2.

**THE WILLIAMSON HEATER CO.**

*W. L. M. Heather*

Vice President

**337 W. FIFTH STREET, CINCINNATI, OHIO**



HOW *Dealers* AND THEIR SALESMEN

CAN TURN *Prospects*

INTO *Buyers* WITH

**SALVO  
SELLING**

FIRING EQUIPMENT

CONTROLS

ACCESSORIES

INSTALLATION

A SALES-BUILDING IDEA FOR

*Dealers*

AND SALESMEN IN AUTOMATIC  
HEATING EQUIPMENT

It will take you only a few minutes to read  
the details of this plan. We sincerely believe  
it will help you increase your sales this year.  
Perflex Corporation, Milwaukee, Wisconsin.

TURN THE PAGE



# SALVO

The industries that get the most consumer dollars are the ones that sell *complete units*.

Take automobiles: They sell a car complete; there isn't any argument about the make of radio, or ignition system, or any other accessory. The salesman concentrates on selling Chrysler, Buick, or Ford . . . one name carries everything with it.

Look at refrigerators: Does anybody know who made the motor, or the valves, or the control device? No—you buy *one name* when you buy an electric refrigerator.



Here's another interesting fact. American railroads, as we all know, have been having a pretty tough time competing for freight with trucking firms. So what did they do? They established a *unit selling* program. Now you telephone, and the railroad picks up your freight, hauls it to the tracks, loads it on a freight car, and at the other end delivers it to the consignee's door. One unified service, one bill to pay. Does this unit-selling work? The railroads found out it does.

So we come to Automatic Heat—and find all too few applications of this proven selling principle. Most dealers and salesmen start out all right, playing up comfort, convenience, cleanliness, and so on, then offering a named unit to fulfill the prospect's desire. At this point, however, eager salesmen often *confuse* their

prospects by talking about some accessory by a brand name different from the name of the burner already introduced. *Confusion* slows down decision, encourages odious comparisons, and frequently kills a sale completely.

Careful consideration of all these facts has led us to propose an idea—a slogan, if you will—that will prevent this confusion and odious comparison. That idea, that slogan, is "SALVO SELLING."

A *salvo* is the simultaneous firing of several pieces of artillery so that the shells all strike the objective at the same instant. The increased impact thus produced has far greater effect than if the shells landed one at a time. That's the kind of selling we propose for Automatic Heat.

Put everything you've got in *one salvo*. The firing equipment itself, the controls and other accessories, the installation—all *one unit*, to be bought under *one name*. It doesn't make any difference who made the bolts, or the wire, or the thermostat, or the motor—but it makes a great deal of difference if you lose the salvo effect on your prospects by scattering your "shots."



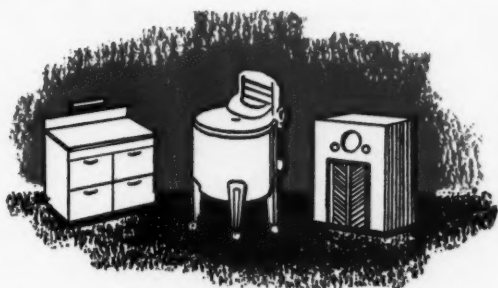
It works for automobiles . . . it has increased freight business for the railroad . . . it sells vacation trips . . . it even sells food. Practically every appliance . . . ranges, water heaters, washing machines, refrigerators, radios . . . has used Unit-Selling—SALVO SELLING—for

# SELLING

**Salvo** (sal'vō) *n.* Simultaneous discharge of several artillery pieces aimed at a single target, to obtain combined impact of the several shells at the same instant.

years. These industries really got going when they quit talking about assemblies of various branded parts and began to sell complete single name units.

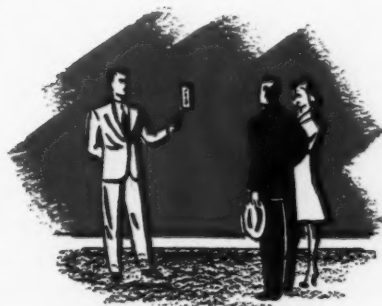
To you as a dealer or salesman in the Automatic Heating industry, the most convincing evidence that SALVO SELLING does actually increase sales is the experience of those manufacturers who have adopted a program of carrying their own name-plate on controls and other accessories. **NOT A SINGLE MANUFACTURER WHO HAS TRIED THIS METHOD HAS EVER GONE BACK TO THE CONFUSION OF THE OLD-FASHIONED WAY OF DOING BUSINESS.**



SALVO SELLING will increase your sales of automatic heating equipment. Talk up the name of the unit you have to sell, and make that one name represent **EVERYTHING**, including accessories and installation. Your prospect will not be confused. You will avoid unfair comparisons. Your prospect quickly becomes a customer, because he will not have to make up his mind about two or three things instead of one.

Practically all nationally known heating appliance manufacturers furnish controls and other accessories under their own names, and use the principle of unified selling . . . one name for the completed installation. Additional advertising and good-will value comes from having

the name of your burner on the thermostat in the living room. That's a part of the effectiveness of SALVO SELLING.



We urge you to capitalize on this kind of selling, because it works just as well for automatic heating as for the examples we have cited from other lines. We've prepared a little book . . . a brief sort of sales manual . . . showing you how to apply SALVO SELLING to increase your sales, and will gladly send a copy free at your request.



**PERFEX CORPORATION**

500 West Oklahoma Avenue  
MILWAUKEE, WISCONSIN

Single reprints of this three-page advertisement will be sent free upon request to bona fide members of the Automatic Heating industry. Quantities of reprints will be supplied by special arrangement to those who wish to distribute them to their own dealers or salesmen.





● **DID YOU, TOO**, watch the WINKLER boat go by—FULL STEAM AHEAD? Is your stoker business still floundering like a rudderless raft, while WINKLER Distributors steam into harbor with boat loads of profits!

Must your prospects buy your stoker on faith? Or can you *prove* to them by actual demonstration that it is expertly engineered, powerful, rugged—capable of a lifetime of trouble-free service! WINKLER offers features that are important to the stoker buyer—the only Fully Automatic Transmission, Eez-Air Control, Pneumatic Smoke-Back Eliminator—and a WINKLER demonstration proves the superiority of these features. Buying action follows buying conviction. Have our field representative demonstrate the Winkler to you.

Analyze your present stoker proposition. Is it backed by a manufacturer's sales program that digs down to bed-rock with a hard two-fisted, dynamic sales service, full of dynamite! Or is it mere top-dressing—a couple of steak dinners, fancy talk, and reams of literature. Investigate the Winkler Sales Program.

Is the factory representative, who calls on you, merely a good will order taker? Or is he a thoroughly

trained stoker engineer, merchandising counselor, and straight-shooting salesman who can help you organize your business on a sales producing basis! Find out about Winkler's direct from factory help.

Your sales and your profits—your future stoker business depends upon your unbiased analysis of your present stoker line. Does it measure up to WINKLER Standards?

Each year, WINKLER sales have doubled the previous year. Each year, hundreds of stoker merchants change to WINKLER. Each year, WINKLER Distributors in 35 states earn greater profits than ever before. Each year, WINKLER'S price, quality considered, is the lowest. Each year, WINKLER'S sales service is unequalled.

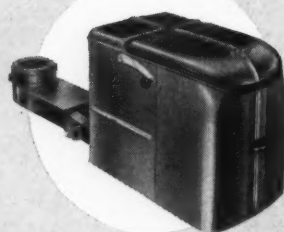
Talk to the WINKLER Distributor in your neighboring town. You can't afford to miss the WINKLER boat this year. Next year may be too late! Hundreds of stoker merchants waited too long. In towns that are still open they are booking passage on the WINKLER boat at an unprecedented rate! Investigate the Winkler Direct From Factory Franchise for your town today.

**U. S. MACHINE CORPORATION**  
400 WEST MAIN STREET • LEBANON, INDIANA



# WINKLER *Stokers*

45 MODELS AND SIZES  
HOPPER AND BINFEED TYPES



A REALLY COMPLETE LINE  
FOR DOMESTIC AND COMMERCIAL NEEDS



**AT LAST**  
*It's here!*

## GRADUAL SPEED

### *Thermostatic* **BLOWER CONTROL**

### *for Forced Air Heating*

The heating industry has been *waiting* for this *practical* solution to the problem of properly controlling blower operation—the much-needed COMFORT improvement in forced-air heating—the important feature that *eliminates* the most common cause of customer dissatisfaction and excessive service expense—

## *The* **MASTER BLOWERTROL** *Thermostatic* **HYDRAULIC CONTROL**

It automatically regulates the blower speed in direct ratio to the bonnet temperature of furnace or heating unit—first starting the blower motor under *no load* (quietly!) at 115° F—then starting the blower at slow speed—*gradually* increasing and decreasing the blower speed as the bonnet temperature rises and falls. (See chart at left, comparing the BLOWERTROL cycle of operation with the operating cycles of conventional blower controls.)

This steady, smooth, quiet, gradual-speed BLOWERTROL operation does away with chilling blasts, hot blasts, air stratification, “cold 70”, cold drafts, blower-starting noise and excessive strain on blower motor. It assures more constant and healthful air circulation, more uniform and *comfortable* room temperature, and fuel economy.

BLOWERTROL is simple in construction, automatic and dependable in operation, soundly engineered, thoroughly tested and proved in actual home service operation. It is adaptable to any forced-air heating system using a centrifugal blower, regardless of fuel used—to new or old installations—and as factory equipment.

**MODERATE COST** —priced well within the means of the small home owner.

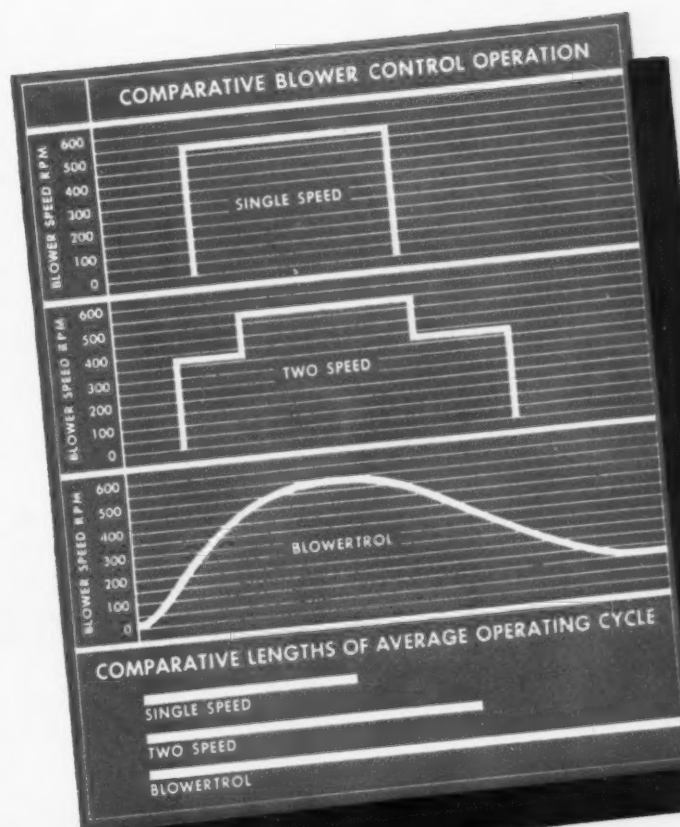
#### **WRITE FOR BULLETIN**

giving full information, details of construction and operation.

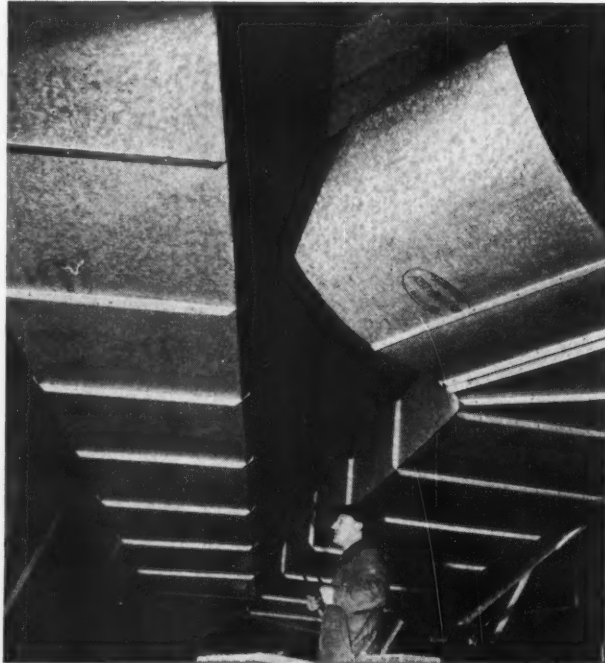
### **WHITE MANUFACTURING CO.**

2360 UNIVERSITY AVE.

MINNEAPOLIS, MINN.



# *For Complete Protection*



*indoors and out...*

**GIVE 'EM**

**Beth-Cu-Loy  
Copper-Bearing  
Galvanized  
Steel Sheets**

With so many industrial jobs coming the sheet metal worker's way the question of corrosion in ductwork, roofing and siding is more important than ever. For industrial conditions expose sheets to more than double the normal corrosive action of the atmosphere. You can lick this handicap for your customers and build a lot of good will and repeat business, simply by using Beth-Cu-Loy Copper-Bearing Galvanized Steel Sheets exclusively, wherever metal work is exposed to extra hazards of corrosion. Beth-Cu-Loy sheets will give far longer service than non-copper-bearing sheets, yet the added cost is only a few cents per sheet.



**BETHLEHEM STEEL COMPANY**



# MAKE MORE MONEY with Westinghouse

## SALES PROGRAM



CO-OPERATIVE NEWSPAPER  
ADVERTISING



MAGAZINE  
ADVERTISING



TRADE PAPER  
ADVERTISING

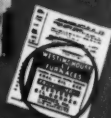


"TROUT  
PREVIEW"  
METHOD

SWEET'S  
CATALOG



DEMON-  
STRATION  
HOME



TELEPHONE  
BOOK ADV.



SALES  
TOOLS



IDENTIFICATION  
SIGNS



ENGINEERING  
SCHOOLS

ENGINEERING  
SCHOOLS

## SUMMER AIR CONDITIONING As easy to install as a heating plant



Refrigeration engineering is out. The complete system is factory built, charged and tested—shipped ready to install.

Nine Unitaire Conditioners—1, 2, 3, 5, 7½, 10, 15, 20 and 25 hp size. Get this plus-profit business now.

## PROGRAM...

IS NECESSARY. Product alone can't sell itself in volume. The Westinghouse Home Heating Sales Program is complete. It includes:

Advertising in your local paper on 50-50 co-operation basis... national advertising to back up your effort, maintain 95% consumer acceptance.

Display of complete line by easy-to-finance floor plan. Attractive display materials. Powerful Neon signs to identify your store with Westinghouse.

Selling. Seasonal sales campaigns that click. Everything to equip, train and stimulate your salesmen.

We have facts to prove conclusively that this program...

## SELLS...

MORE MERCHANDISE. Records of successful merchants using this program show big sales increases over preceding years with other lines. You can do the same. For you can have a sales program that gets results, plus a line of...

## PRODUCT...

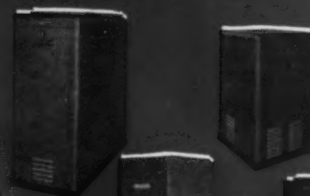
that never lets you lose a sale. Something to sell for every size home, every type fuel, every type system.

It all adds up to more profit for you!

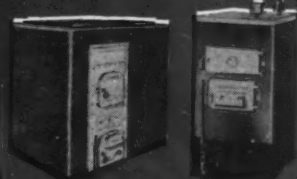
## PRODUCT



OIL BURNING UNITS



GAS BURNING UNITS



COAL BURNING UNITS



## GET THE FACTS!

# Westinghouse

## HOME HEATING AND AIR CONDITIONING

Westinghouse Electric & Manufacturing Co.,  
Springfield, Mass.

Please send the following:

- ☐ Complete catalog of Home Heating Equipment.
- ☐ Complete catalog of Packaged Summer Air Conditioning Equipment.
- ☐ Have your representative call.

Name \_\_\_\_\_

Firm \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

Prevent *Sabotage* of your equipment by  
needless bearing failure

with *Randall*  
PILLOW BLOCKS



\* More manufacturers of air handling equipment are standardizing on Randall Pillow Blocks, because they eliminate bearing failures and needless shut down of your equipment.

Why take a chance? Rely on dependable Randall Pillow Blocks, the bearings that are used on more air-handling units than any other. Randalls are *trouble-free*, quiet, self-aligning, self-lubricating and will last a life time with minimum attention. They are low in cost and economical to install.

Over a million and a quarter Randalls in use, is evidence of their continuous satisfactory service. If Randalls are not now standard on your equipment, consult our engineers without obligation, or write for free catalog showing the complete Randall line with details and specifications.

*Representatives Carrying Stocks*

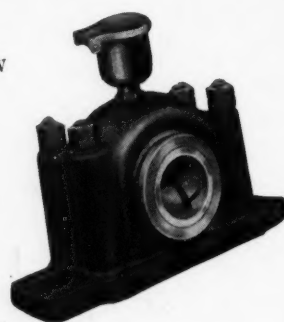
C. W. Marwedel  
San Francisco, Cal.

Salt Lake Hardware Co.  
Salt Lake City, Utah

Tek Bearing Co.  
177 Lafayette, New York City  
1192 Commonwealth Ave., Boston, Mass.

UNIVERSAL PILLOW  
BLOCK

Designed to meet the most exacting demands of engineers, the Universal operates satisfactorily in any position under severest conditions.



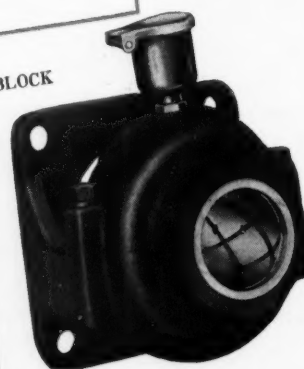
ONE-PIECE STEEL  
HOUSING PILLOW BLOCK

This low-cost bearing is the most popular in the industry. Can be supplied with rubber isolating grommets.

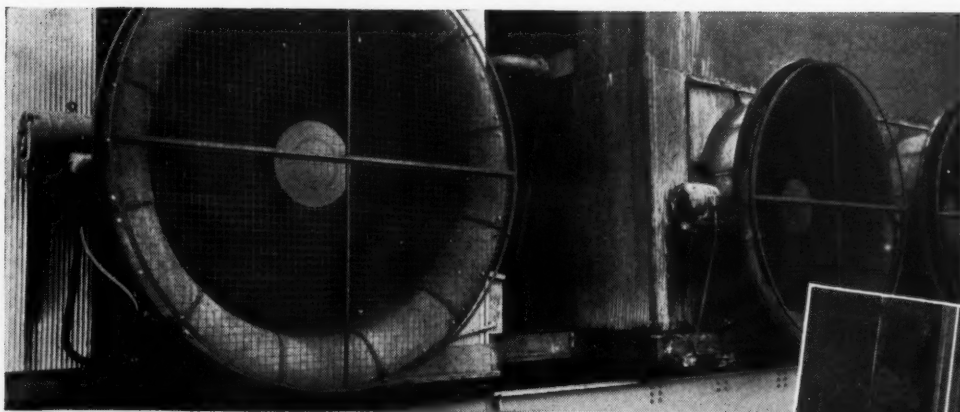


FLANGE PILLOW BLOCK

The rugged construction of the Flange provides ample safety factor for the most severe side mount bearing applications.



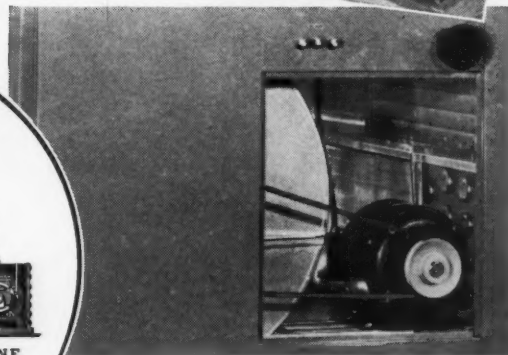
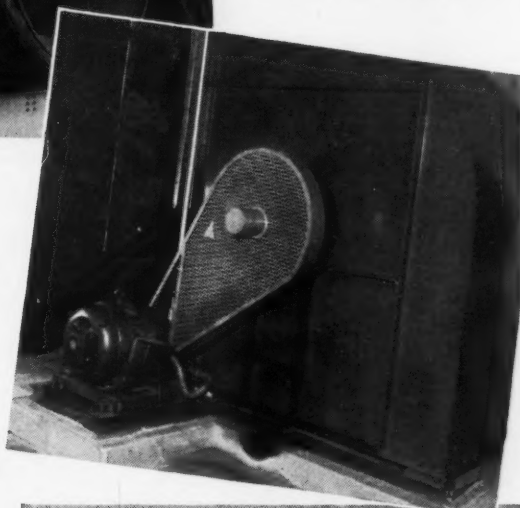
**RANDALL GRAPHITE PRODUCTS CORPORATION**  
DEPT. 511 609 W. LAKE ST. CHICAGO, ILL.



**At Left** — Century 15 horsepower Splash Proof Motors driving cooling tower fans.

**Below** — Century 7½ horsepower Squirrel Cage Motor driving a Blower.

Century 1 horsepower Repulsion Start Induction Motor driving an Air Conditioning Unit.



## For **SMOOTH, QUIET** **BLOWER PERFORMANCE** Specify **CENTURY** *Job Selected* **MOTORS**

● Regardless of load requirements or the location of the installation, there's the correct Century **JOB SELECTED** Motor to meet every requirement of air circulation.

For blower drives, whether installed indoors or out, the proper Century Motor will give you efficient, dependable, *quiet* operation.

Century Motor Characteristics that meet the requirements of air circulation:

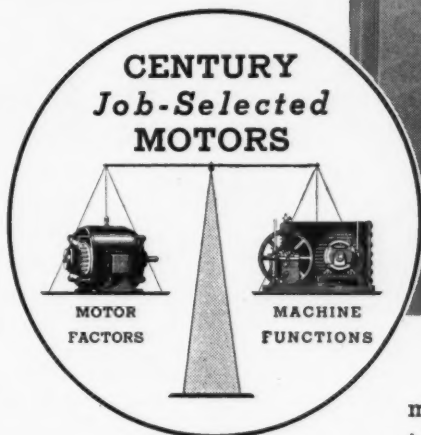
Unusual freedom from electrical and mechanical vibration

Century's unique bearing bumpers reduce chatter from V-belt irregularities

Cushion base mounting isolates possible vibration from your installation

Quiet starting, quiet acceleration and quiet operation at all times.

Whatever your motor require-



ments in the heating, cooling or ventilating field, there's the correct Century **JOB**

**SELECTED** Motor to assure the most satisfactory, economical performance ... available in a wide variety of types and sizes from fractional to 600 horsepower.

Your nearest Century Motor Specialist will gladly help you and your engineers to select the proper motor to meet your specific application requirements. Call him in today.

### **CENTURY ELECTRIC COMPANY**

1806 Pine St. St. Louis, Missouri

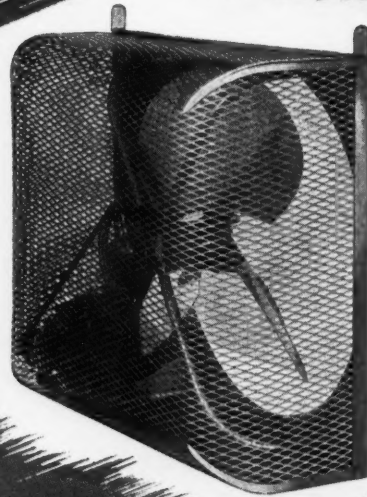
Offices and stock points in principal cities.



*One of the Largest Exclusive Motor and Generator Manufacturers in the World*



# Comfort Cooling



## FOR THE MASSES . . .

*Your Greatest Profit Opportunity  
This Spring and Summer*

## LAU NITEAIR Window Fan

• Now made to retail for less than \$50.00, this handsome new NITEAIR WINDOW FAN appeals to the big mass market wanting comfort cooling at a low price.

Millions of homes and apartments want them for bedrooms, kitchens, living rooms. Offices, stores, clubs, churches, funeral homes, etc. from coast to coast and as far North as Canada need Niteair comfort cooling. Tenants as well as owners are prospects because these models are portable appliances.

Lau offers a complete Niteair comfort cooling line . . . a model for every conceivable type of installation including attic, wall, window, basement, and commercial installations. And Lau engineers will gladly help you solve difficult or unusual problems at no extra cost to you.

Plan now to cash in on this mass market opportunity. Write for catalog, profit plan and sales discounts today.



### 7 FAMOUS FEATURES MARK NITEAIR SUPERIORITY

**1 LOW COST** . . . less in first cost because of efficient manufacturing . . . less in ultimate cost because of increased operating efficiency.

**2 COMPACT!** It "disappears" into the window. Capacity is ample for two or three rooms.

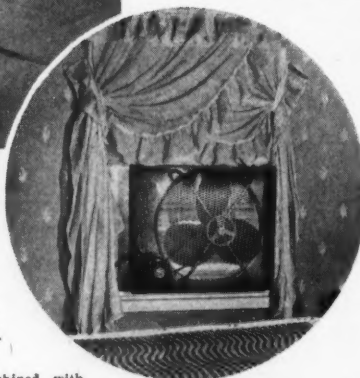
**3 SILENT!** Three deep pitched blades statically balanced and all moving parts and bearings rubber mounted assure a whispering wind . . . silent as a summer night's breeze.

**7 PRACTICAL!** Fits in windows from 24½" to 34" wide. Also equipped with adjustable tri-leg standard for installation on the floor. Plugs in at any light socket.

**ATTRACTIVE!** Close woven metal guard, finished in lustrous grey lacquer; has rich beauty in character with finest interior decorations and appointments.

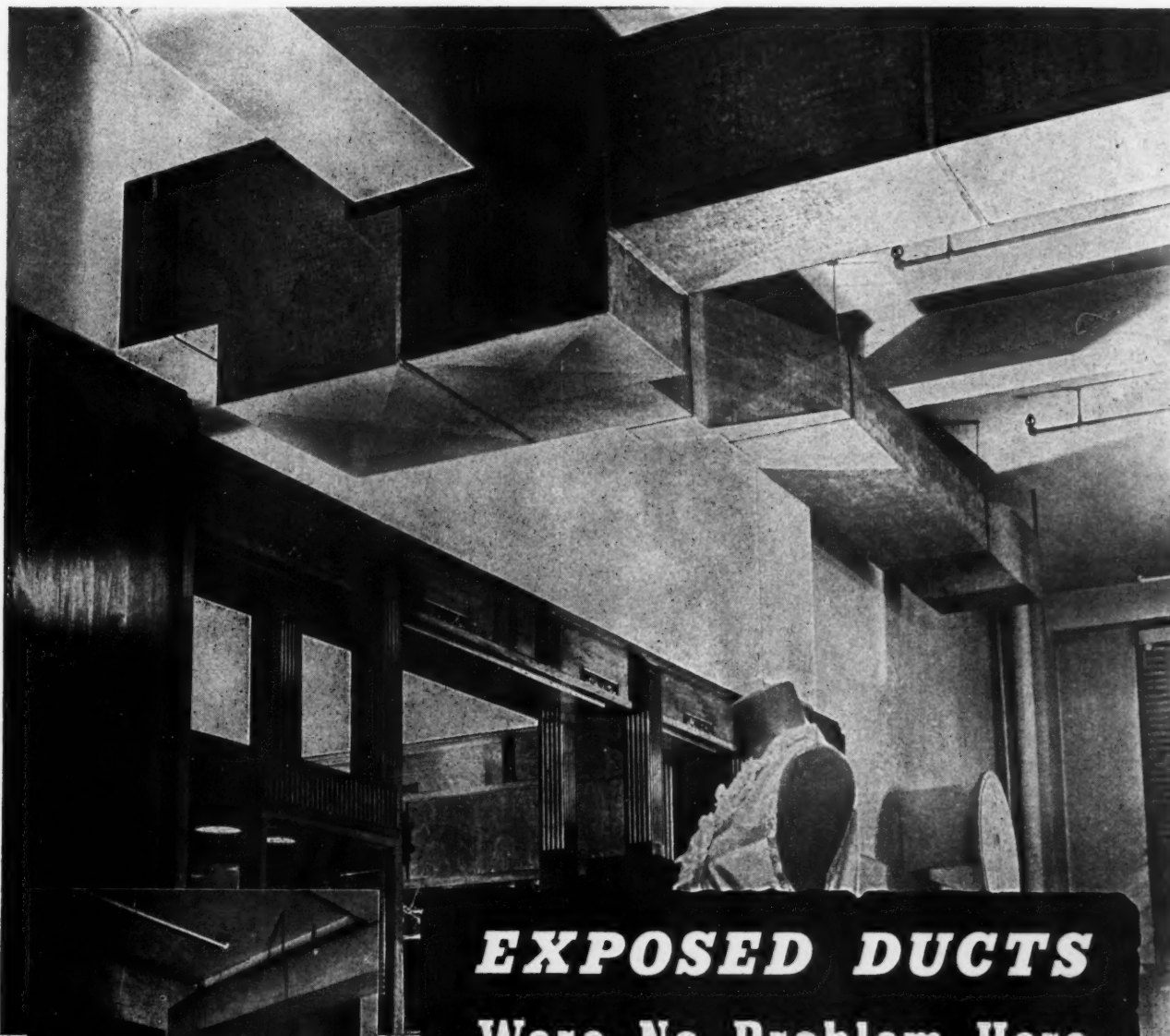
**5 LIGHT WEIGHT!** Combined with strength. Weighs only 50 lbs. with grille and 5" window spacer.

**6 IMPROVED EFFICIENCY!** Stream-lined Venturi-type Entrance Housing gives Niteair Room Cooler new high performance standard with minimum of air turbulence and noise.



**THE LAU BLOWER CO.**  
2005 Home Avenue Dayton, Ohio





## **EXPOSED DUCTS** **Were No Problem Here**



*Business went on as usual at the Stix-Baer & Fuller Store, St. Louis, when this new duct system was installed. Galvanized ARMCO PAINTGRIP sheets made a speedy, durable paint job. Sodeman Heat & Power Company was the contractor; Leo S. Weil and Walter B. Moses were the engineers.*

New ductwork systems in old buildings used to be nightmares to contractors and engineers. Department stores are a good example. Now much of the old grief is gone. Contractors "in the know" use galvanized ARMCO PAINTGRIP sheets and the painters follow right along.

This specially bonderized sheet not only takes paint, but *preserves* it. Field tests show that paint lasts at least 150 per cent longer than on ordinary galvanized metal. No acid-etches or special primers are needed, there is less danger of damaged merchandise, and business goes on as usual. Wouldn't your customers

welcome this assurance?

Forming is no problem either; for ARMCO PAINTGRIP works, welds and solders much the same as regular galvanized sheets. This holds down shop costs and helps keep the work on schedule.

Use ARMCO PAINTGRIP sheets for exposed ductwork, or wherever the job requires the immediate beauty and added protection of paint. More than 200 paint companies have approved PAINTGRIP. Just call the nearby ARMCO Distributor or write us direct for prices and a free scratch sample. The American Rolling Mill Co., 1681 Curtis St., Middletown, O.

**Galvanized**



**ARMCO PAINTGRIP SHEETS**

# New Penn Type 661 Offers Voltage Protection at a Popular Price

## Small, Compact Unit Provides Big Stack Switch Performance . . . Sturdiness

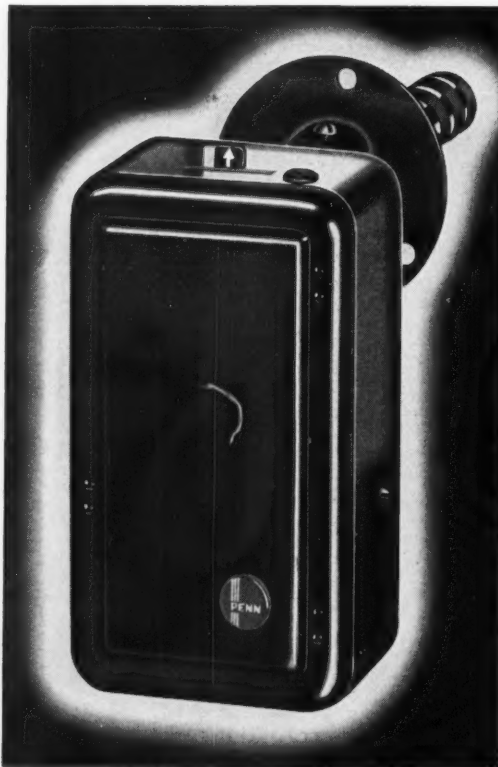
Field experience on thousands of oil burner installations has proved the value of *automatic Voltage Protection*, offered four years ago by Penn Electric Switch Co., on its 670 and 672 Series Stack Switches. Now this same *plus value* is available in the new Type 661 Stack Switch—another of many Penn control developments contributing to *lower installed prices* with constantly increasing dependability . . . length of trouble-free operating life . . . customer satisfaction. Give Penn's new Type 661 Stack Switch a trial. It will pay you in profits and performance.



### Compact without crowding

Compactness is achieved without sacrificing wiring space or necessary ruggedness of operating parts; in the new Penn Type 661 Stack Switch. Flexible leads are entirely eliminated and internal wiring is concealed behind and protected by the laminated bakelite panel.

Penn Electric Switch Co., Goshen, Indiana. In Canada: Powerlite Devices, Ltd., Penn Electric Switch Division, Toronto, Ont. Export: 100 Varick St., New York City. Branches, representatives and distributors in all principal cities.



## What is "Voltage Protection?"

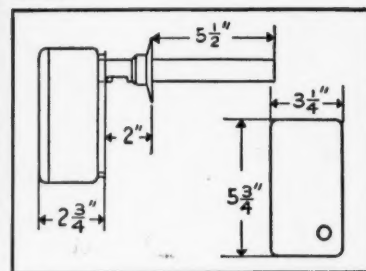
With conventional stack switches, it is possible to pump slugs of oil into the combustion chamber with a slowly turning pump, even at supply line voltages so low that the standard ignition transformer will not give a dependable spark across the ignition electrodes. Exhaustive field research has shown that such supply line voltage drops occur *all too frequently* in oil burner markets.

Even though they do occur, it is *impossible* to create a potentially hazardous condition with a Penn stack switch equipped burner, because *automatic Voltage Protection* shuts the burner down before ignition failure occurs.

Oil burner manufacturers and dealers using Penn Stack Switches report a surprising decrease in the number of unexplainable "puffs." Such failures due to voltage drop on the supply line *cannot occur with Penn-built stack switches.*

## Rigid Design and Production Standards Strictly Maintained

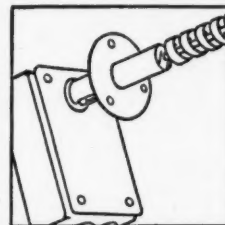
Although popularly priced, the new Penn Type 661 Stack Switch is a *bargain* principally because of sound design and construction features which will be quickly recognized by experienced oil burner men. In addition to *Voltage Protection*, it offers: 1. Heavy gauge pressed steel case with tight fitting cover. 2. Low voltage thermostat circuit. 3. Clean panel with plainly marked, accessible terminals. 4. Electrolytic silver contacts, accessible for inspection. 5. Guarded, tamper-proof safety trip-out device. 6. Over 40 rigid factory inspections and tests during building to insure finest performance under all field conditions. Other points of superiority are indicated in sketches below.



**SMALL SIZE** (above) reduces weight on stack . . . conserves space on installations inside jacketed units. No sacrifice of space for wiring.

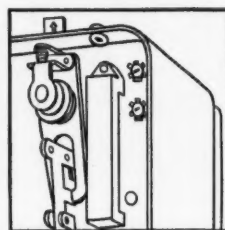
### POLISHED RADIATION SHIELD

(right) reflects stack heat. Ventilation gap between case and shield further reduces stack switch temperature, contributing to long life and accurate, dependable operation.



### HARDENED DIE CUT SPEED RATCHET

(right) engineered with the helix as a closely coordinated unit, is equally efficient on low or high temperature stacks. Note the sturdy molded bakelite guard over safety timing parts, adjacent to ratchet assembly.



More information on what Penn Controls will do for you—One of a Series.

# PENN

## Penn-Built Controls for Many Applications

Thermostats, Bonnet Controls, Ductstats, Fire Protection Controls, Water Temperature Controls, Boiler Pressure Controls, Boiler Water Level Controls, Humidistats, Stack Switches, Stoker Timer Relays, Solenoid

Gas Valves, General Purpose Relays, Solenoid Refrigerant and Water Valves, Refrigeration Pressure and Temperature Controls, Water Valves, Pump Controls, Air Compressor Controls, Air Volume Controls, Line Starters.



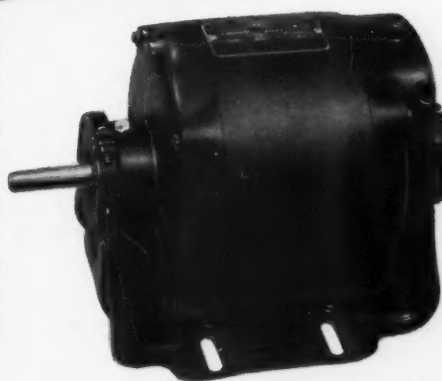
## ALL HEATING INSTALLATIONS ARE QUIET *On Paper* . . .

They are *dynamically balanced* . . . that is the first fact you should know about Delco motors for all heating and air-conditioning applications. It's a feature that safeguards your customers against motor vibration being carried through the house by ducts.

Other factors that contribute to quiet operation are the exceptionally fine machining of shaft and bearing surfaces . . . the generous use of materials in the frame . . . the improved, resilient-base mounting . . . the Delco End-Play Take-up Device for V-belt drives . . . and the Delco Centrifugal Switch that assures positive, quiet starting action.

Delco motors have demonstrated their dependability and all-round ruggedness on a wide variety of applications in the appliance and industrial fields. Stators are wound, insulated, baked and dipped while separate from frame, to permit better workmanship; rotors are copper-welded without the use of solder; and the

Delco Thermotron provides complete motor protection against overload and overheating. Consult the Delco Products Engineering Department for recommendations.



**SPECIFY DELCO MOTORS  
for quiet performance**

**DELCO  
TWO-SPEED MOTOR**  
for blowers . . . oil burners

Delco two-speed motors solve the problem of stratification in forced air systems, and permit a further reduction in operating noise. Write for further information.

**DELCO**

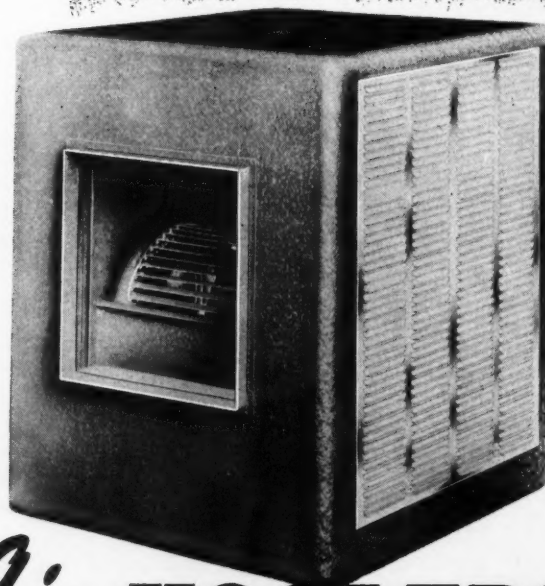
DIVISION OF GENERAL

**DELCO  
PRODUCTS**  
DAYTON, OHIO

**MOTORS**

MOTORS CORPORATION

# Proven Profits



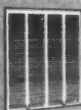
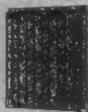
with **UTILITY Air KOOLERS**

Only  
**UTILITY Air KOOLERS**  
combine all these  
*Proven* features



**UNI-FLOWMETER**  
Patent Pending  
Assures uniform  
water distribu-  
tion to all pads

**"NO-SAG" PADS**  
Patent No. 2,182,501  
Can't slip or set-  
tle to cause void  
air spaces



**STREAMLINE  
PAD GRILLES**  
Permit unrestricted  
air flow—reduce  
static pressure

Dynamically Balanced  
Centrifugal **BLOWER**  
Operating cost  
is low—effi-  
ciency high



## The Market is *Proven*

In every part of the country evaporative air cooling is making tremendous gains, yet the market hasn't really been scratched. Every business establishment, factory and home is a prospect for this efficient, economical method of comfort cooling.

## The Product is *Proven*

Thousands of satisfactory installations have proven Utility air Coolers under all conditions. More Utility air Coolers are in use than any other make. Utility pioneered evaporative air cooling—leads the field. Utility air Coolers are scientifically designed and developed by experienced engineers in a modern, completely equipped laboratory.

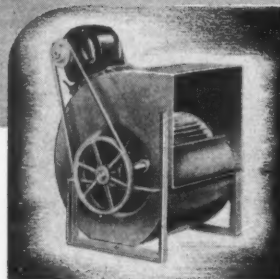
Your profits are assured when you sell Utility air Coolers. They are priced to sell... carry a generous profit... are best known... a complete line of quality products... from a dependable source of supply. For catalogs, prices and name of nearest distributor, write

## **UTILITY FAN CORPORATION**

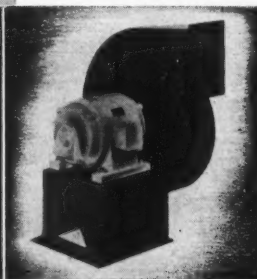
4851 S. Alameda

Los Angeles, California

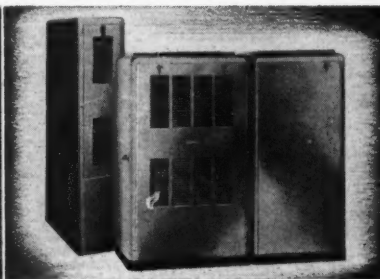
Manufacturers of gas-fired heating equipment, ventilating and cooling equipment



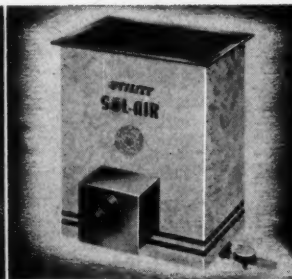
• Standard and Heavy Duty Blowers •



• Industrial Exhausters •



• Forced-air Furnaces •



• Floor and Dual Register Furnaces •

# Compare these new *NET* REGISTER PRICES *with what you have been paying*



**SIZES:**  
4", 5", 6", 8", 10" heights.  
8", 10", 12", 14", 24", 30"  
widths. Other sizes made  
up special.

## PERMANENTLY STREAK-PROOF

Look at this "Seal-Tite" construction—  
an exclusive flexible packing member  
is an integral part of the back frame.  
It makes a streak-proof joint—simpli-  
fies your job—satisfies your customers.  
Only Char-Gale has it.

## Compare the

# CHAR-GALE

## "Seal-Tite"

## with any other Register

Compare the new improved Char-Gale "Seal-Tite" Register for appearance—capacity—directed air flow—and remember it eliminates wall streaking. Here's a register that will help you *sell* more jobs—and make more profit per job too! Get the whole story—send at once for our NEW NET PRICE SHEET—and you'll say it's the best register deal on the market.

## WE SELL THROUGH JOBBERS

but send directly to us for your Net Price Sheet, and give us your jobber's name. Send the coupon today.

**A** FEW years ago Char-Gale started to make a better register to sell at a lower price. The idea has had sensational acceptance.

Now Char-Gale smashes another tradition with its new **NET PRICE SHEET**, giving you the exact **NET** price in money of each item. No more confusing chain discounts to take your time—you can tell the price at a glance. What are *you* paying for registers? Compare with these prices:

## Here's an example of our NEW NET PRICES:

(other sizes and styles in proportion)

12" x 6" Baseboard Register 500 quantity price	<b>69¢ NET</b>
14" x 6" Baseboard Vent 500 quantity price	<b>43¢ NET</b>
<b>TOTAL</b>	<b>1.12</b>
<b>AVERAGE COST EACH, ONLY</b>	<b>56¢ NET</b>

## RUSH TODAY NEW CHAR-GALE NET PRICE SHEET

Name .....  
Street .....  
City ..... State.....  
Jobber's Name .....  
Jobber's address .....

☐ Do you have installation problems? If you want Char-Gale's new Simplified Estimating Chart, check here.

Mail at once to

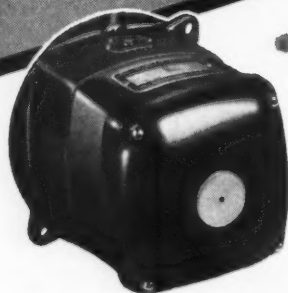
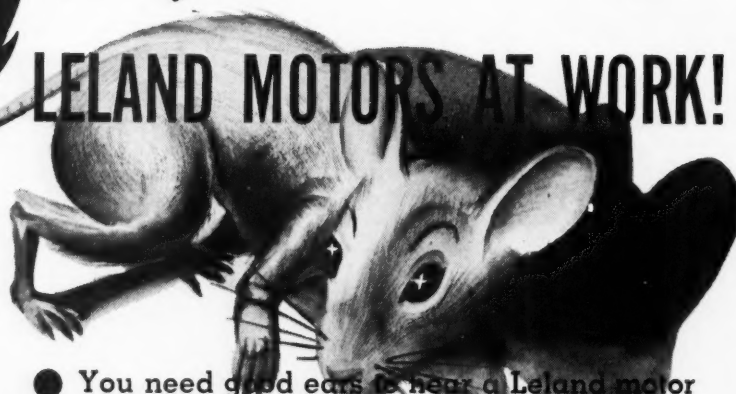
**CHAR-GALE MANUFACTURING CO.**

Pre-Fabricated Air Conditioning Ducts and Fittings  
3125 Hiawatha Ave., Minneapolis, Minnesota



# sh-h-h-h

## LELAND MOTORS AT WORK!



● You need good ears to hear a Leland motor from a distance of only five feet. For Leland motors are precision-built . . . giving you the degree of quietness so essential for modern fans, blowers, unit heaters, and water circulators.

● You should know that our bearings are diamond bored . . . in fact, we were the first to do so. Clearances on rotating parts are kept to the unusual accuracy of .0001". Among the rigid inspections is the test for quietness, conducted in a special sound-proof room . . . and woe to the motor that utters the slightest peep.

● There's much more to the Leland story, of course . . . dependability so great that few motors ever require factory service . . . special designs created to do the job at hand and no other . . . an attractive square frame design that impresses prospects . . . extra features of importance such as the Leland thermomatic protector.

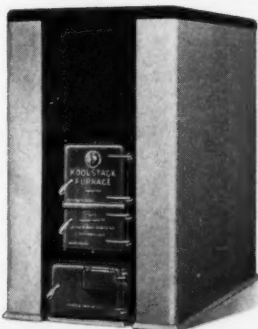
● In short, Leland motors are built . . . built to give your products those necessary motor extras. If you will write us, we will place a Leland motor in your hands for verification of our statements. THE LELAND ELECTRIC COMPANY, DAYTON, OHIO.

# Leland Motors

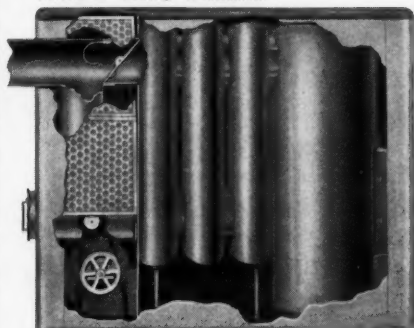
• FOR ALL TYPES OF HEATING AND VENTILATING EQUIPMENT

# KOOLSTACK *Leader* FURNACES

## YOU WAITED 15 YEARS FOR THEM



For Oil Burner or Hand Firing  
Forced or Gravity Circulation



Enclosed Filters and Blower  
Automatic or Hand Firing



Stoker Applied at any  
Practicable Angle



Round Cased For New or  
Replacement Jobs

Most dealers have wondered why the warm air furnace did not keep pace with heating progress. Oil Burners and Stokers have done all that could be asked in the field of automatic heat, but their benefits were not fully realized because most warm air furnaces were not engineered to the higher temperatures, and gas velocities developed in automatic heat.

### FUEL SAVINGS ALONE WILL PAY FOR THE KOOLSTACK

Now stack temperatures can be controlled positively and automatically by a patented principle exclusive with the Koolstack Furnace.

Many home owners would be money ahead if they junked their obsolete and wasteful furnace and put a Koolstack on the job.

Few people realize what it is costing them in fuel when stack temperatures are running above 300°. They continue to pay a useless toll for heat that goes up the chimney.

### ENGINEERED FOR OIL BURNERS STOKERS HAND FIRING

### FLEXIBILITY MEANS SMALLER STOCK

Heating loads ranging from 50,000 to 200,000 BTU's are handled by one basic unit with a few small interchangeable parts. You can operate on a comparatively small stock.

### A SIZE AND TYPE FOR EVERY HOME—In One Dependable Line

The five room cottage or the larger dwelling can have the benefits and savings of the Koolstack Furnace. There is a size for practically every operating load. The customer's requirements may change after the job is installed, but the Koolstack Furnace is quickly and easily enlarged to meet the new requirements, because it is flexible.

### IT HAS GLAMOR, TOO

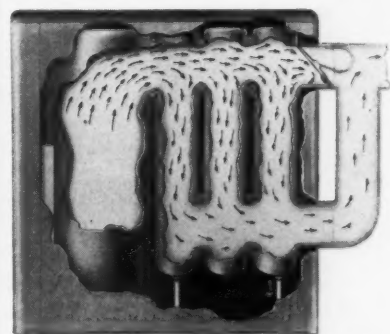
Two-Tone Baked Enamel Finish as illustrated, or round cased, as desired. No matter how it's dressed, it saves fuel and heats homes better.

### A DEVELOPMENT THAT MADE HEATING HISTORY



Satisfactory operation of any furnace, whether oil burner, stoker or hand firing is used, requires sufficient heat in the stack, but it is the proper balance and control of heat at the right time in the firing cycle that counts, and that is just what the Leader Automatic Damper does. The arrows tell the story.

This patented Damper positively regulates stack temperatures so excessive heat cannot pass into the stack, but instead is directed to additional heating surface in the Koolstack Furnace where it is absorbed and distributed to the heating system. 15 years of service without repair or replacement is an average record.



Note hot gases contacting heating surfaces. That's why the stack is cool.

WRITE FOR DISTRIBUTORS' PLAN TODAY

## LEADER IRON WORKS INC.

2841 N. JASPER STREET

DECATUR, ILLINOIS

*We would like  
you to meet—*

**Perkinson and Brown**  
SHEET METAL CONTRACTORS  
Since 1892

410 N. WOLCOTT

CHICAGO, ILL.

On the left WILLIAM PERKINSON

On the right HERMAN BROWN

Mr. Herman Brown, 76 years young, a co-founder of the Company with Mr. Perkinson's father. Established 1892, Perkinson and Brown has done work on the buildings of two World's Fairs... the Columbian Exposition and the Century of Progress.

By the time this comes to your attention we shall have ready for distribution a new booklet telling all about Toncan Copper Molybdenum Iron (containing twice as much copper as the best copper-bearing steel or as any copper-bearing iron) and its advantages to the sheet metal contractor. Ask for Booklet.

**"DOES IT MEAN ANYTHING TO HAVE A CUSTOMER SAY: 'I won't have to worry about that job during my lifetime'?"**

"Yes, so far as we are concerned it does.

"Because what the customer actually intends to convey is that he is very well satisfied with our work. This in turn signifies that the next time he has a sheet metal job, we will be given every consideration.

"And that isn't hearsay on our part. We know—because we have proved that to be a fact many times over since our founding in 1892. This boils down to one important benefit . . . profitable business.

"Two factors inspire a customer to make such a statement. One, of course, is good workmanship and we certainly pride ourselves on that. The other is the metal you use. So far as we are concerned, Toncan\* Iron is *THE sheet metal*. It is uniform, so in working you know what to expect. Flaking trouble is eliminated, because the galvanized coating adheres tightly. And customers know Toncan

Iron will stay intact for a long time.

"What is most important, the total difference in cost on the average job between ordinary metal and Toncan Iron is only a few pennies.

"Many of our customers insist upon Toncan Iron. For one such account, we have installed over a period of years several thousand feet of our pet specialty, Toncan Iron skylights. In 1940, for instance, we placed approximately 30,000 square feet of these, including one that was 462 feet in length.

"Toncan Iron's qualities are an old story to the firm of Perkinson and Brown. We have been using this metal with the green stencil since it was placed on the market in 1908. It has always satisfied us and has helped us to satisfy our customers."

**REPUBLIC STEEL CORPORATION**

General Offices: Cleveland, Ohio

BERGER MANUFACTURING DIVISION • CULVERT DIVISION • NILES STEEL PRODUCTS DIVISION  
STEEL AND TUBES DIVISION • UNION DRAWN STEEL DIVISION • TRUSCON STEEL COMPANY

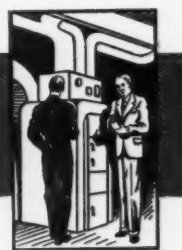
\*Reg. U. S. Pat. Off.



**REPUBLIC TONCAN IRON**

An alloy of refined open-hearth iron, copper and molybdenum—that grows old slowly





## Rearmament Cannot Progress Without Construction

THE warm air heating-sheet metal fabricating industry is, today, occupying a confusing position in the even more confusing picture of American business.

The picture, for want of a better analogy, may be likened to a wheel—the wheel of America's rearmament effort. At the hub are the direct rearmament industries—the producers of guns, tanks, planes, ships, combat equipment of a thousand varieties.

On these industries America is concentrating an effort without parallel in history for a nation at peace.

Circling this hub, and practically inseparable, are those industries which make rearmament possible—the producers of machine tools, machine and equipment parts; the railroads; basic raw material producers; motor vehicles; coal and oil; and the nation's financial system.

On these our efforts have not been quite so intense—they have been given a plan—they have been pushed—but we have expected that their "usual business" shall continue—within reason.

Next out from the hub, we think, lies the construction industry in all its ramifications. Construction must build the training camps; the powder and tank plants; the armament buildings; and the thousands of factories which will produce the thousand and one items we need so badly. Construction must also revamp, remodel, rehabilitate thousands of old structures which are today filling up.

Because the direct and indirect rearmament industries have taken so much of our time and thought, construction and all American business lying farther out toward the rim of the wheel have been left to shift pretty much for themselves. We have been expected to "get along" somehow—to carry on business "as usual" yet, at the same time, carry our part of the load. This, we think, has caused the confusion in determining our status.

These buildings, new or old, must have roofs, must use sheet metal protection—they must be heated, ventilated even air conditioned for certain processes. There is and will be millions of dollars of work for our industry in this essential program.

But these factories will be just so much brick and lumber and idle machines until people are engaged to operate them. These people must have homes—some place to live.

Up to now, so far as we can see from reports, most of the industries contributing to rearmament, are or have been deliberately located in or adjacent to large labor markets. This has come because our effort toward production speed has required awarding contracts to existing factories already located in or near plentiful labor.

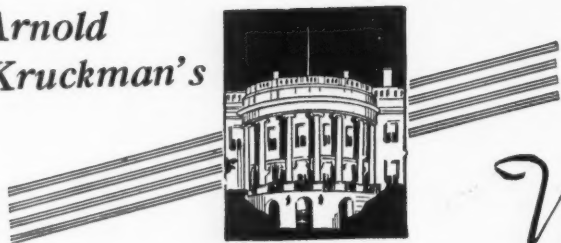
In most cases, these existing factories have had to employ scores, hundreds, thousands of additional workers. The result has been living quarter congestion which we thought we never would see again.

Government is bending every effort to alleviate this condition. Apartment buildings, single and multi-family houses are under construction or under contract or in the planning stage by the thousands in practically every community where our hub activities are located. Government has even turned to trailers, portable houses, tents to provide immediate quarters.

The exception to this condition is the new plant or industry deliberately located away from what up to now has been a labor market. We have been reading about powder and shell plants on raw farm land; of tank and gun factories in small communities; of plane parts or assembly plants in the wide open spaces.

These exceptions, Washington says, point to a carefully determined course of action. We will, from now on, build new cities, new plants in areas not thickly settled.

(Continued on page 128)



## Washington Letter

### Congress Looks at Rearmament Costs

SOME time in May, or June, unless Congress throws a monkey wrench, the Army will ask contractors to figure on another \$2,000,000,000 construction program. This is virtual duplication in money volume of the first program which Congress is giving some microscopic attention at this moment. The chief buildings to be constructed in the second and impending program include dozens of defense factories, 30 and more ordnance plants, a number of aircraft factories, at least a half dozen heavy bomber plane plants, not less than three bomber engine plants, several bomber fuselage frame factories, and the conversion or building of a number of other engine plants. The funds are to come from Mr. Roosevelt's \$7,000,000,000 Lend-Lease fund and from funds expected to be provided in pending appropriations by Congress.

#### Factories to Rural Areas

It may be illuminating to remember this when you try to determine where this avalanche of work is to be done. Early in April the Army and the OPM circulated a memorandum which defined the location of future defense plants on sites involving "strategic security . . . efficiency for defense production . . . permanent consequences for the economic life of different parts of the nation."

It was laid down as axiomatic that "sites be avoided in cities or regions where defense orders are absorbing available labor supply, congest housing, transport or other facilities. That every possible preference be given to locations where large reserves of unemployed or poorly employed persons are available and where industrialization will contribute to a better long-run balance between industry and agriculture. These conditions are particularly acute in many areas of the South and the West. Where facilities must be located in the present industrial areas, special attention should be given to regions which have suffered a decline in their peacetime industries or to cities which have not been heavily engaged in defense production. The Plant Site Committee, recently established, in OPM supercedes the National Defense Advisory Commission. Its program will be de-

veloped "in accordance with a broad policy of decentralization."

These words mean that in the East, the West and the South, the new plants and communities will be located where population is heaviest and where raw materials are most accessible and where there is adequate transportation. AND where political pressure is most effective. Make no mistake, it is inevitable that the community with the most powerful political leaders and the most powerful lot of votes, will win the most powerful consideration. There is nothing evil or immoral in this; it is the realism of life.

You get some inkling of the difficulties in construction when you realize that over 4,000 thoroughly qualified and competent prime contractors are listed on the QM approved record, and that the QM has been able to deal with only 400. Subcontractors who wish to get contracts should get in touch with the Defense Contract Service office in their region. A list of the cities where the local offices may be found is in the last issue of the American Artisan.

#### Where to Get Contracts

It is the job of these DCS people to help you get in line for subcontracts. They should be able to tell you the details before the prime contracts have been let. They **should** have in their offices copies of the specifications and the bid invitations sent to the prime contractors. You may find they do not have these papers. And naturally if they do not have the information **before** the contracts are let, your chances of getting some of the business are reduced. The prime contractor naturally makes his arrangements, at least most of them, before the awards are published. Therefore, when you go to the DCS people tell them to get in touch with Washington and to insist that Washington send to them copies of the specifications and bid invitations. The specifications and bid invitations are not military secrets and you have a legal right to share in the opportunity to get the business. And no one really wishes to hold out. Most reluctance springs from fear of violating some Bureau practice, or from pure inertia.

#### Cantonment Costs

If you find the Quartermaster people jittery, don't hold it against them. They have been going through a particular and special kind of a hell of their own, lately. Congress is investigating why the 245 camps and cantonments cost almost twice as much as the original estimate. The estimate was \$500,000,000, and the cost was slightly under a billion. This paid for 9 camps housing 30,000 men each; 36 housing from 10,000 to 30,000 men each; and 200 sheltering under 10,000 each. The Congressional Committee has gone through the costs of Ft. Meade, Md., and Ft. Belvoir, Va., with a fine-toothed comb, and it is about to launch upon the quiz concerning Ft. Benning, Ga. Others come later, unless the Administration heads off the investigation on the grounds that it is subversive to public morale in War time. It develops that when the first program was launched new mobilization plans had to be made in June, 1940, presumably by reason of the great changes wrought by the War as it developed in Europe. Furthermore, piecemeal legislation is blamed for piecemeal planning. All layout plans were made on the ground of the project by conference between Quartermaster officers and the Corps Area Commander. The layouts thus made by the QM Construction officers in the field were used by the architects and contractors whom they supervise.

At Ft. Meade, Md., unskilled workers received 62½¢ per hour; sheet metal workers, plumbers, steamfitters, \$1.37½¢ per hour; carpenters, \$1.25; bricklayers and electricians, \$1.50; painters, \$1.12; structural iron workers, \$1.65. At Ft. Belvoir, Va., sheet metal workers received \$1.75 per hour; steel workers, \$2.00; and carpenters, \$1.62½. The new construction head in the Quartermaster Corps explained the difference between the rates at Ft. Meade and Ft. Belvoir, about 20 miles apart, by the fact that they were in different Labor Union jurisdictions. Gen. Brehon B. Somerville, trouble-shooter extraordinary, made clear that the wage schedules had been imposed by the National Labor Relations Board and approved by the Quartermaster General.

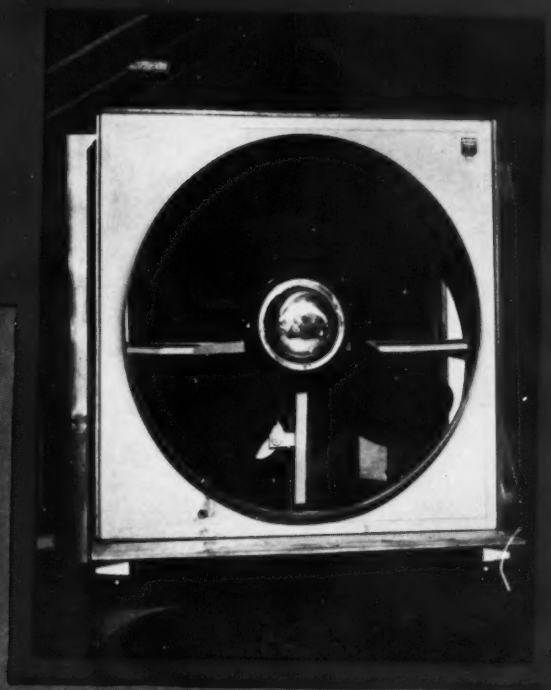
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AMERICAN ARTISAN

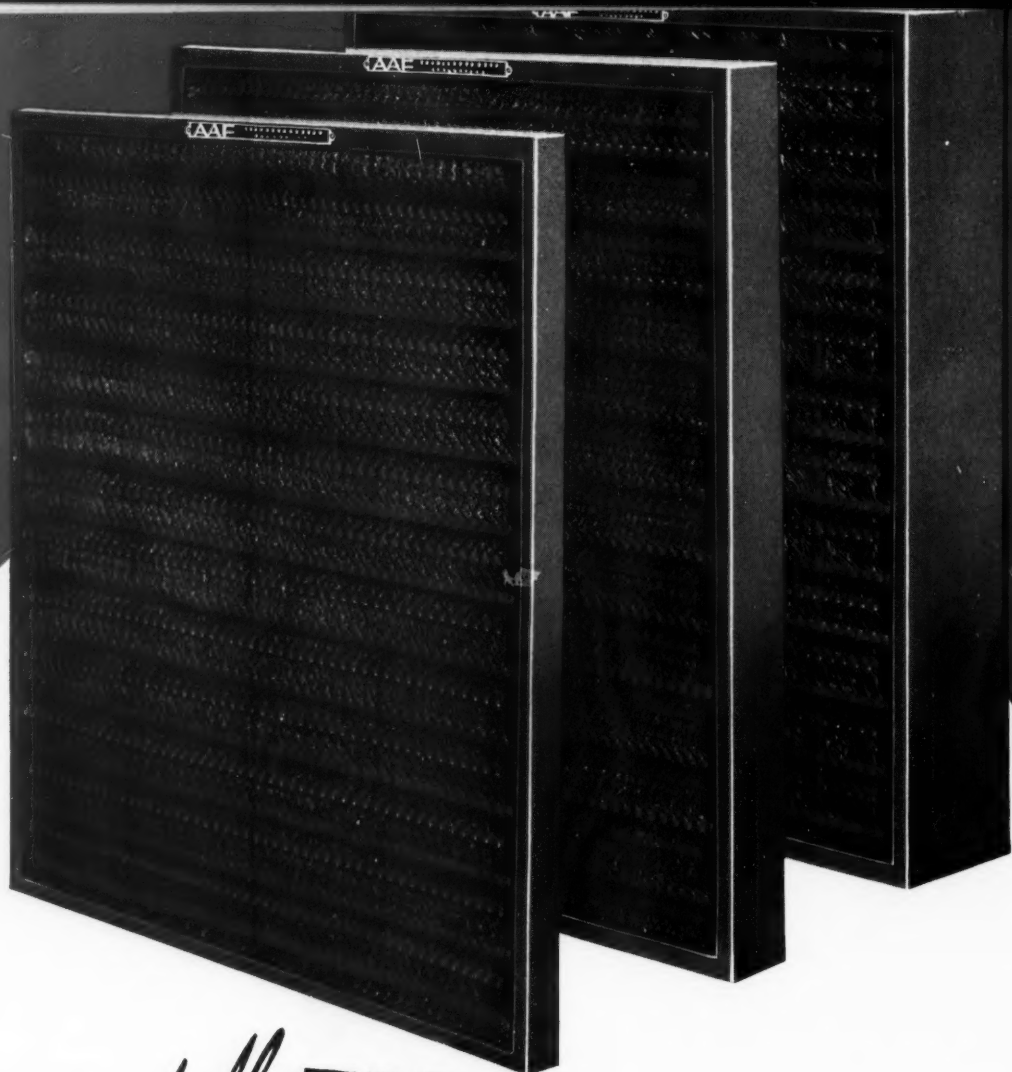
# RESIDENTIAL AIR CONDITIONING

S E C T I O N



DEVOTED TO HOME AND SMALL COMMERCIAL AIR CONDITIONING





# A-C *Washable* FILTERS

## GIVE PERMANENT FILTER SATISFACTION AND SERVICE—AT LOWEST COST

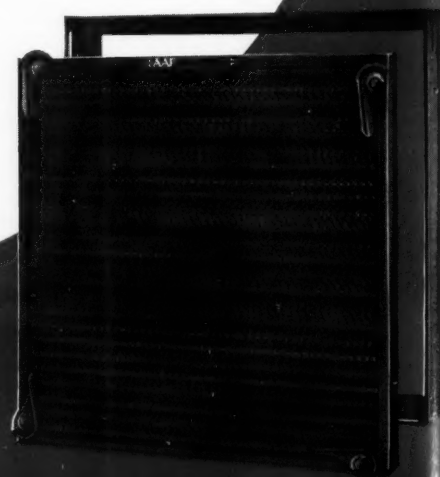
American Type A-C Filters were designed for use in unit air conditioners and warm air conditioning units where filters with washable features are desirable and the dust conditions are not abnormally severe. The outstanding features of the A-C Filter as compared to renewable types are its greater dust storage capacity and low maintenance cost coupled with higher cleaning efficiency.

The special construction of the herring bone baffles enable the A-C filter to collect a considerable volume of dust and lint without restricting air passages or increasing air flow resistance. The finer dust particles are collected by successive layers of knitted galvanized wire mesh. Here is real quality at amazingly low cost for no other filter on the market has as great dust holding capacity per square inch of filter surface as the A-C filter.

Cleaning is simply handled by first rapping all loose dirt and then washing under a hot water faucet. After being re-coated with Viscosine, the filter is again ready for service.

Furnished in 3 thicknesses, 1", 2" and 4". The 1" and 2" cells without frames are available in standard sizes and can be made to order in special sizes for unit air conditioners and warm air conditioning units.

Engineering data and installation details helpful in installing the A-C Filter are given in Bulletin No. 67. Write for your copy



# AMERICAN AIR FILTER CO., INC.

INCORPORATED

141 CENTRAL AVENUE LOUISVILLE, KENTUCKY

# FHA's New Heating Requirements

These "Requirements" are not in general application by all FHA offices. New York City and Jamaica, Long Island are, we understand, the two offices where these requirements are being tried out. If the requirements prove practical, useful and advantageous to owners in these two areas, probably application will be extended to all other offices. We publish these requirements as indicating FHA's thinking on warm air heating.

## A. Plans and Specifications:

### 1. On the plans are to be shown:

- a. The total hourly heat loss of the building in BTU.
- b. The hourly heat loss of each individual room in BTU.
- c. The location of the boiler or furnace.
- d. The size and location of all ducts, grilles, registers, radiators and convectors.
- e. The cubic feet of air per minute delivered to each room and the total air per minute delivered to the house.  
(Mechanical Warm Air Heating System).
- f. Location of the thermostat (automatic systems).
- g. Location and size of fuel storage equipment, such as tanks, fuel boxes, and storage bins.
- h. Kind and extent of fire-retarding construction.
- i. Kind of insulation, weatherstripping, etc.
- j. Bathroom supply must be computed for 80°F at outside temperature of Zero°F.

### 2. Specifications are to include:

- a. The names of manufacturers, catalogue numbers and capacities and firing rates of boilers (see boilers), furnaces (bonnet-output), blowers, burners, ventilators, specialties, etc., and the limits of adjustments of all control devices.
- b. Additional information which will facilitate the checking of the installation.
- c. A certification by the manufacturer of the boiler and radiators, and/or by the manufacturer of the furnace specifying that the heat losses have been calculated by him in accordance with the data and methods described in the current edition of the "Guide" of the American Society of Heating and Ventilating Engineers including local exposure and wind velocity allowances and that the amount of radiation and the capacities of the boiler or furnace scheduled are adequate and properly balanced if installed in accordance with the layout shown on the plans to heat all rooms, vestibules and exposed halls in the house to 70°F when the outside temperature is Zero°F.

## B. General Codes and Regulations:

1. Installation and construction shall comply with the appropriate rules and regulations of the National Board of Fire Underwriters, American Gas Association, and with all applicable local codes and ordinances.
2. Heating equipment shall be installed so that there are ample clearances for contingent access for cleaning, adjustment and servicing of equipment and for the replacement of parts, such as tubes, sections, etc.

3. When types of equipment are listed by the Underwriters' Laboratories, equipment of this type used in the dwelling shall be required to be **listed and labelled** by the Underwriters' Laboratories, or ruled as acceptable by the Jamaica Insuring Office.
4. Automatic gas-fired equipment shall conform with the standards of the American Gas Association.
5. Heating equipment shall be in operating condition during the third compliance inspection to demonstrate that operation is satisfactory from the standpoint of noise, economy, and general performance, and that the system has been thoroughly and properly cleaned.
6. Complete printed operating instructions of the manufacturer of the equipment shall be posted securely and permanently on or adjacent to the boiler or furnace.
7. The manufacturer's and installer's printed Guarantees and Service Agreements, regularly furnished and as may be additionally required by the Federal Housing Administration, shall be posted with the instructions.
8. A ventilated space above the top floor ceilings and ventilated space below the floors of basementless houses shall be considered to be at the outside design temperature.  
Note: Such spaces are required to be ventilated.
9. Gravity circulation of air, water or steam through a system of ducts or pipes will be permitted provided—
  - a. The top of the heater, boiler or furnace is below the floor level of all first floor habitable rooms.
  - b. The top of any register in any room on the first floor or above is not more than 18" above the floor level of the room in which it is located.
  - c. Mechanical distribution will be required when the requirements for gravity circulation are not met.
  - d. Forced circulation and gravity circulation of the heating medium will not be permitted from a single heating unit.

### 10. Additional Information Required:

- a. Plans and specifications covering warm air systems shall show in addition to the above:
  1. Details of typical bends, sweeps, deflectors and of any unusual conditions.
  2. Designed air temperature and velocity at registers, designed maximum velocity in ducts.

C. Warm Air Systems shall comply with the following:

1. Rules and Regulations of the N. B. F. U. as set forth in Part 2 of Pamphlet No. 90. Compliance will be required particularly with the following:

- a. Warm air ducts shall be constructed entirely of non-combustible material equivalent in structural strength and durability to galvanized iron or steel.
- b. Horizontal supply ducts of metal shall have at least 1" clearance from combustible construction, including plaster on wood lath and  $\frac{1}{4}$  inch clearance from metal lath and plaster on combustible material. Asbestos cement ducts are to have  $\frac{1}{2}$  the above clearance and ducts insulated with  $\frac{1}{2}$  inch or more of non-combustible insulation will require no clearance.

- c. Supply ducts shall not enter combustible construction within a horizontal distance of 6 feet from the furnace.

- d. Supply ducts in closets shall be insulated with  $\frac{3}{8}$  inch asbestos or equal fire-resistive insulation, or made double with 1" air space between inner and outer walls.

Note: See N.B.F.U. Pamphlet for additional requirements where maximum bonnet temperature is not automatically controlled with a control device provided with a maximum high limit of 200°F.

- e. When a propeller fan is used to boost circulation there shall be no change in the pipe sizes from those calculated for gravity circulation.
- f. The capacity of leader pipes is limited to 111 BTU per sq. in. for first floor registers and 167 BTU per sq. in. for second floor registers. The areas of wall stacks for first floor registers are to be at least equal to the leader pipe supplying them and the areas of wall stacks for second floor registers may be reduced to 70% of the leader pipe size.

2. "Standard Gravity Code for the Design and Installation of Gravity Warm Air Heating Systems." This Code applies only to gravity systems.

(Note: Heat losses and pipe sizes must be figured by BTU infiltration method as recommended by the "Guide" of the A.S.H.&V.E.)

The principal specifications contained in it are:

- a. No leader pipe shall be less than 8 inches in diameter or more than 12 feet in length.
- b. If the supply to one room is greater than the capacity of a 12 inch pipe, two pipes and consequently two registers shall be used.
- c. A continuous metal return is required from return air grilles to the furnace.
- d. The area of the return air duct or ducts shall equal or exceed the total area of all supply pipes.

3. "Technical Code for the Design and Installation of Mechanical Warm Air Heating Systems." This Code applies only to forced systems and shall be used in conjunction with "A Yardstick for the Evaluation of a Forced Warm Air Heating System." The "Code" and the "Yardstick" are overlapping. The principal specifications contained in the Code and not covered by the "Yardstick" are:

- a. The total building CFM shall equal or exceed five complete air recirculations through the system per hour.
- b. Allow at least  $\frac{1}{4}$ °F. temperature drop in warm air per foot of uninsulated duct.
- c. Return air ducts shall not be smaller than supply ducts and shall be sized on basis of returning 100% of air supplied.

4. The "Yardstick for the Evaluation of a Forced Warm Air Heating System." This pamphlet, published by the National Warm Air Heating and Air Conditioning Association, of 145 Public Square, Cleveland, Ohio, shall be used as a guide in determining the acceptability of a Forced Warm Air Heating System aside from its heating capacity. Construction or equipment rated as Class "C" shall not be acceptable and general recommendations shall be followed.

5. Other designs and installations shall be submitted to the Jamaica Insuring Office for ruling as to acceptability.

6. Additional requirements for Forced or Gravity Warm Air Heating:

- a. Return air grilles or registers shall have free area equal to the area of ducts to which they are connected.

- b. Return grilles shall be so located that air supplied to one room need not pass through another room (not a hall or corridor) to reach a return grille.

- c. Return grilles shall not be located in stair risers.

- d. Return air shall not be drawn from or through a utility room or basement.

- e. Filters shall not be installed in such a manner as to be subject to direct radiant heat from primary or secondary heating surfaces.

- f. Equipment must be satisfactorily quiet for the location.

- g. Systems shall be all forced air or all gravity air distribution.

- h. Blower when installed shall be installed on return side of furnace.

- i. Warm air furnaces for coal firing shall have a ratio of heating surface to grate area of not less than 15 to 1, and shall be constructed of not less than No. 14 gauge steel or  $\frac{3}{8}$  inch cast iron at thinnest points of fire pot section. For oil firing, furnaces shall have a combustion volume sufficient to prevent flame impingement on unprotected surfaces when the furnace is fired at its rating, and shall be constructed of not less than No. 18 U. S. gauge steel or  $\frac{3}{8}$  inch cast iron at the thinnest points of fire pot section. For gas firing, furnaces shall comply with the A. G. A. performance and construction requirements.

- j. Furnaces shall have a bonnet output not less than 133% of the total calculated hourly heat loss for the dwelling.

- k. Installation of coils for heating domestic hot water will not be permitted in heating units with automatic firing.

- l. For forced air, a return must be provided from each habitable room.

- m. For gravity air, a single return register will be acceptable in full basement, one story houses of not over 800 sq. ft. floor area, provided the plan is adapted to such a system and provided that warm air supply registers are so located as to insure uniform heat distribution.

- n. Direct cross connections between rooms of any sort will not be allowed, and layout of ductwork must be such that sound transmission to or from bedrooms or bathrooms is not facilitated.

- o. All return registers in bedrooms must be capable of a complete shut-off by the occupant at the register.

- p. No return shall be taken from kitchen, bath or lavatory back into the system, and doors to these rooms must be fitted with ordinary tightness. Each such room must be provided with



a relief vent with balanced backdraft damper, with duct opening into attic space at least 18 inches above the floor, or in row houses, into space above hung ceiling. A ventilating fan is acceptable in lieu of such vent from kitchen, as is the ventilating duct to open air required in interior lavatories.

- q. Vestibules, whether or not shut off by an inner door, must have positive means of heating. For vestibules under 25 sq. ft. floor area this may be interpreted to mean only a return grille, unless some other factor renders this inadvisable.
- r. Any duct passing through a garage must be enclosed by fire retarding approved as equivalent to  $\frac{3}{4}$  inch cement plaster on metal lath. No return from garage will be permitted and a supply, if there is one, must have a balanced back draft damper and be on an individual duct direct to unit.
- s. No duct or air passage may be wider than four times its least dimension nor less than 3 inches in least dimension.
- t. Access shall be provided to all dampers.
- u. Hangers for ductwork must be of strap iron or approved sheet metal straps. There must be at least one hanger per joint.
- v. Floor registers will not be permitted in bathrooms. The so called "out of wall" baseboard type will be acceptable.
- w. One supply stack must be so arranged that it is impossible to cut it off completely. This will be normally the bathroom supply.
- x. A plenum chamber enclosed in underfloor space, above plaster, must be insulated and the space ventilated as approved.

#### E. Fire Equipment

1. All gas-fired equipment shall conform to the standards of the American Gas Association. Evidence that the equipment complies with this requirement shall be the seal of the A.G.A. Laboratory.
  - a. A Certificate furnished by the local utility company containing the burner manufacturer's guarantee, the results of a combustion test, data on the heat requirements of the system and a service guarantee shall be required to be posted permanently near the installation and shall be signed by the authorized representative of the utility company. A duplicate certificate shall be forwarded to the Jamaica Insuring Office.
2. Mechanical Draft Oil burners shall be constructed and installed in accordance with the requirements of Commercial Standard CS75-39. The Underwriters' label on the burner shall be plainly visible and the words "Commercial Standard CS75-39" must appear on it.

The firing rate at which the burner is set shall be:

- a. Not less than the firing rate for which the burner has received Underwriters' CS75-39 approval.
- b. Not more than the firing rate designated on the boiler name plate or designated for the boiler by the Jamaica Insuring Office.

This requirement supersedes the firing rate requirements Article 23 (4) of the CS75-39.

**Note:** The Certificate and service guarantee shall be signed by the manufacturer of the burner or his authorized representative and no one else.

The service guarantee shall be understood to

be effective for not less than one year from the date of occupancy of the building by the mortgagor.

The following statement shall be added to that part of the certificate covering the installation test above the signature:

**"The CO<sub>2</sub> firing rate and stack temperature are guaranteed to be maintained without an adverse change of more than 10% from these results for a period of one year from the date of occupancy."**

3. The following controls shall be required:
  - a. Thermostat (or equivalent).
  - b. Combustion safety control (stack switch, protecto-relay, etc.)
  - c. High limit control (Pressurestat, aquastat, bonnet temperature control, etc.)
  - d. Low limit control (aquastat, fan switch, etc.)
4. Natural draft oil burners shall be installed in accordance with the requirements of the National Board of Fire Underwriters' Pamphlet No. 31 and shall bear plainly visible the seal of the Underwriters' Laboratories.

Heating units fired with this type of burner shall be connected to a chimney not less than 18 feet in height and with a smoke pipe (measured horizontally) not more than 3 feet in length and with not more than two 90° elbows, or if these requirements are not met, a test shall be conducted by the installer on the completed installation to show that the draft available at the outlet of the heating unit is not less than the draft specified in the listing of the Underwriters' Laboratories for the particular burner used when the stack temperature at the outlet of the heating unit is not more than 700°F. Results of this test are to be submitted before the third compliance inspection.

5. Stokers for anthracite coal shall be constructed and installed in accordance with the requirements of Commercial Standard CS48-40.
6. Hand-fired furnaces and boilers are to be provided with all necessary firing tools, cleaning equipment and pressure- or temperature-actuated damper control equipment.

#### G. Breechings:

1. Breechings shall be constructed of material at least equivalent to 24 gauge black iron or steel.
2. They shall be run as direct as possible to the chimney, but in no case over 12 feet long—breeching must pitch upward toward chimney 1 inch in 12 feet.
3. A thimble or special breeching connection shall be provided in the chimney to receive the smoke pipe, where required.
4. Hand-fired equipment shall be provided with an ash pit damper, a check damper, and a turn damper in the breeching, the latter to have at least a 20% opening when the damper is in the closed position.
5. For all oil-fired equipment the draft regulator or automatic damper required by CS75-39 shall be listed by the Underwriters' Laboratories.
6. Gas-fired equipment shall be provided with a gas diverter constructed in accordance with the recommendations of the American Gas Association Laboratory.

(Continued on page 125)

# 1940 Sales of Attic Fans

## In 9 Active Sales Areas

### *Plus Some Information on the Progress of Other Forms of Cooling in These Areas*

**E**IGHT years ago a new industry appeared on the residential comfort horizon. This industry was announced without fanfare in an unobtrusive report from the Research Residence staff at the University of Illinois.

The report said in effect that a fan placed in the attic of a house could reduce evening and early night indoor temperatures to outdoor temperatures and thus obtain sleeping comfort.

#### Attic Fan Principles Are Simple

The provisos were—a fan with capacity sufficient to change all the air in the house at least 30 times each hour; a fan located so as to “pull” air in through all opened windows to the fan; some manipulation of openings to direct the air through rooms to be cooled; provision for the air passing through the fan to escape outdoors; installation of and selection of a fan which ran quietly enough to permit nearby occupants to sleep.

Interestingly enough this new idea stemmed from a simple fact known to home owners for centuries—namely, that a house does not cool off after the sun goes down as rapidly as does the outdoor air.

With variations, this basic idea of night air cooling has bloomed into an industry which last year accounted for the sale of probably 25,000 large size ventilating fans.

#### “North” Still Hesitating

Last year’s sale of “attic” fans, impressive as it was, is only the beginning. We say “only a beginning” because by some strange coincidence the northern part of the country where night outdoor temperatures fall farthest below daytime outdoor temperatures has not bought attic fan cooling as readily as have southern states where the drop in temperature is not nearly so pronounced.

The answer, probably, lies in the “variations”

mentioned two paragraphs back. The chief variation, of course, is the extension of the original 13 to 30 air changes per hour to 60, 90, 120 air changes per hour, down South. What started out to be cooling by taking advantage of the drop in outdoor temperature after sun-down has come to be cooling by subjecting the body to enormous volume convection cooling.

We know now, by actual experience, that a fan capable of moving sufficient air over the body can cool just as readily as an automobile ride with the top down, even though the air temperature remains constant.

#### Sales in “South” Impressive

Ready acceptance of attic fan cooling was abetted “down South” by several conditions. First, persons acclimated to southern conditions do not require a large actual temperature drop to be comfortable. Second, houses, down South, are not constructed conducive to insulated, refrigerated cooling. Third, persons “live outdoors” and do not wish to step from hot to cold conditions every few hours. Fourth, attic fan cooling is a relatively inexpensive method.

And, so, the attic fan has been selling in the last three years, down South, in numbers which astound northern home owners. Since every advantage found by southern owners applies with three-fold benefit up North, we feel safe in stating that attic fan sales of 1940 are “only a beginning.”

#### 1940 Report of 9 Utilities

What actually was done in 1940 in attic fan sales where figures are based upon actual records and not on “gossip?” The tabulation accompanying was obtained from utilities which kept records of sales. The table is informative in that it shows the quantity of fans sold in localities which have accepted the attic fan idea. What has been

## Survey of Cooling Progress in 1940 in 9 Areas

	Dallas Power & Light Co.	Georgia Power Co.— Atlanta	New Orleans Pub. Service Co.	Oklahoma Gas & Electric Co.	Houston Lighting & Power Co.	Arkansas Power & Light Co.	Electric Power Board Chattanooga	Alabama Power Co., Birmingham	Nashville Electric Service
No. of Attic Fans Sold in 1940	2,869	500	766 AF 1,236 Window Fan	1,000	3,000	854	90	750	370
No. of Contractors Selling Fans	75	25	41	20	80	140	15	50	22
No. of Evaporative Coolers Sold, 1940	186 Res. 772 Com.	15-20	None	?	?	72	No Data	Few	35
Evaporative Coolers Increasing in Popularity with Home Owners?	Yes	No	No	No	Slowly	No	No	No	No
Evaporative Coolers Increasing in Popularity with Commercial Users?	Yes	No	No	Yes	Slowly	Yes	Yes	No Data	Yes
Is Evaporative Cooling a Logical Cooling Method in This Area?	No, Hum. Too High	No, Hum. Too High	No, Hum. Too High	Yes	No, Hum. Too High	Yes, Better Than Attic Fan	No Data	No	No, Hum. Too High
No. of Silica Gel or Similar Drying Method System Sold in 1940	?	None	None	No	?	None	None	?	None
Is Drying Increasing in Popularity as a Method?	No	No	No	No	No	No	No	?	No
Should Cooling by Drying Increase in Acceptance?	No	No	Yes	No	No	Yes	Yes	No	No
No. of Compressor Systems (Central) Installed in Resi- dences in 1940	65	25	41	490	78	176	36	No Data	125
Smallest and Largest Residence Compressor System	1/4-22 1/2	1/4-2	1/4-6	1/4-5	1/4-10 1/2	1-10	1/4-2	No Data	1/4-7
Which will become most popular in Houses—Attic Fans, Evapo- rative Coolers, Compressors?	Attic Fan	Attic Fan	Attic or Window Fan	Attic Fan	Attic Fan	Attic Fan	Attic Fan	Attic Fan	Attic Fan
Which will become most popular in Commercial Establishments —Attic Fans, Evaporative Coolers, Compressors?	Compressor	Compressor	Compressor	Evap. Cooling	Compressor	Evap. Cooler	Refrigeration	Refrigeration	Refrigeration
Was any cooperative advertising conducted in 1940 by contrac- tors, utility, utility and con- tractors?	Dealers, Utility	None	Dealers, Utility, Utility & Dealers	Utility, Dealers	Dealers, Utility, Utility & Dealers	Utility, Utility & Dealers	Utility & Dealers	Utility	Utility
Average size of of attic fan sold	42-in.	42-in.	42"-AF 30"-WF	42-in.	48-in.	42-in.	36-in.	36-in.	1/4 H.P.
Where were most fans installed?	Attic	Attic	Window	Attic	Attic	Attic	Attic .	65% Attic 25% Window	Attic
Fans placed where—	Over Grille	Over Grille	Over Grille	Over Grille	Over Grille	Over Grille	Over Grille	Over Grille	Over Grille
No. of air changes recommended —Per Hour	60/Hr.	60/Hr.	60/Hr.	60/Hr.	60/Hr.	60/Hr.	90-120/Hr.	30-60/Hr.	60/Hr.
Maximum R.P.M. for quiet operation	?	350-400	Depends on Fan	300	Depends on Fan	400-550	400	Depends on Fan	370-400

done in these areas quite likely can or will be repeated in all other communities which have more than two weeks of really hot summer weather.

### Progress by Other Forms of Cooling

In compiling these data we also tried to obtain some information on several pertinent questions which heretofore have been largely "guess." For instance, the number of evaporative cooling installations actually recorded by these utilities and the trend toward or away from evaporative coolers. Also the number of drying-cooling systems going into homes and the relation between compressor cooling and attic fans. The facts, from utility records, are presented.

### Large Volume Needs Cooperative Effort

Attic fan sale is incapable of divorce from attic

fan publicity promotion. Areas where the most fans have been sold are also areas where the utility, the contractor, the manufacturer, the association, have all joined hands and pooled finances to advertise the merits of attic fan cooling. Attic fan sales, records indicate, is a cumulative proposition and accumulates momentum in direct ratio to the number of fans sold year by year. The moral of this is that one man or a handful cannot hope to build large attic fan volume until many men contribute their sales efforts.

The sections of the table devoted to design facts show that in eight years this industry has not moved far from the 1933 design basis. Attic fan cooling requires a large fan; the best location is still the attic; quietness is still a prime problem; the home owner must be shown how to get the maximum results from his fan.

To the utilities contributing data, our thanks.





All the patrons see is the air discharge grilles and short duct stubs which connect to the evaporative units placed on the roof. The plans and elevations facing show all the details. The scheme is to cool and ventilate the customers end of the alleys leaving the pin end air undisturbed.

## Evaporative Cooling in a Bowling Alley

CHICAGO was formerly not thought of as having climate suitable for the use of evaporative cooling. Probably this was because many persons think cooling by evaporation obtains its full cooling effect by decreasing air temperature to the temperature of the water in the unit. And since, unlike cold water coil cooling, the water in an evaporative cooler is recirculated over and over again so that water temperature and air wet bulb temperature become the same, persons have felt that dry bulb air temperature reductions were not very substantial and relative humidity too high for comfort.

The facts are that evaporative cooling has gone beyond originally conceived areas of practicability because evaporative cooling obtains much of its cooling effect from the circulation of very large volumes of air throughout the space to be cooled. The evaporative cooler, under these conditions, circulates as much air as an attic fan—can drop the dry bulb a number of degrees—and offers, in addition, the cleaning effect of wet spray and wet pads.

An excellent illustration of this modern adaptation of evaporative cooling to Chicago climate is offered in the evaporatively cooled Marzano Palace of Pleasure bowling alleys.

The installation is shown in the drawings and photographs.

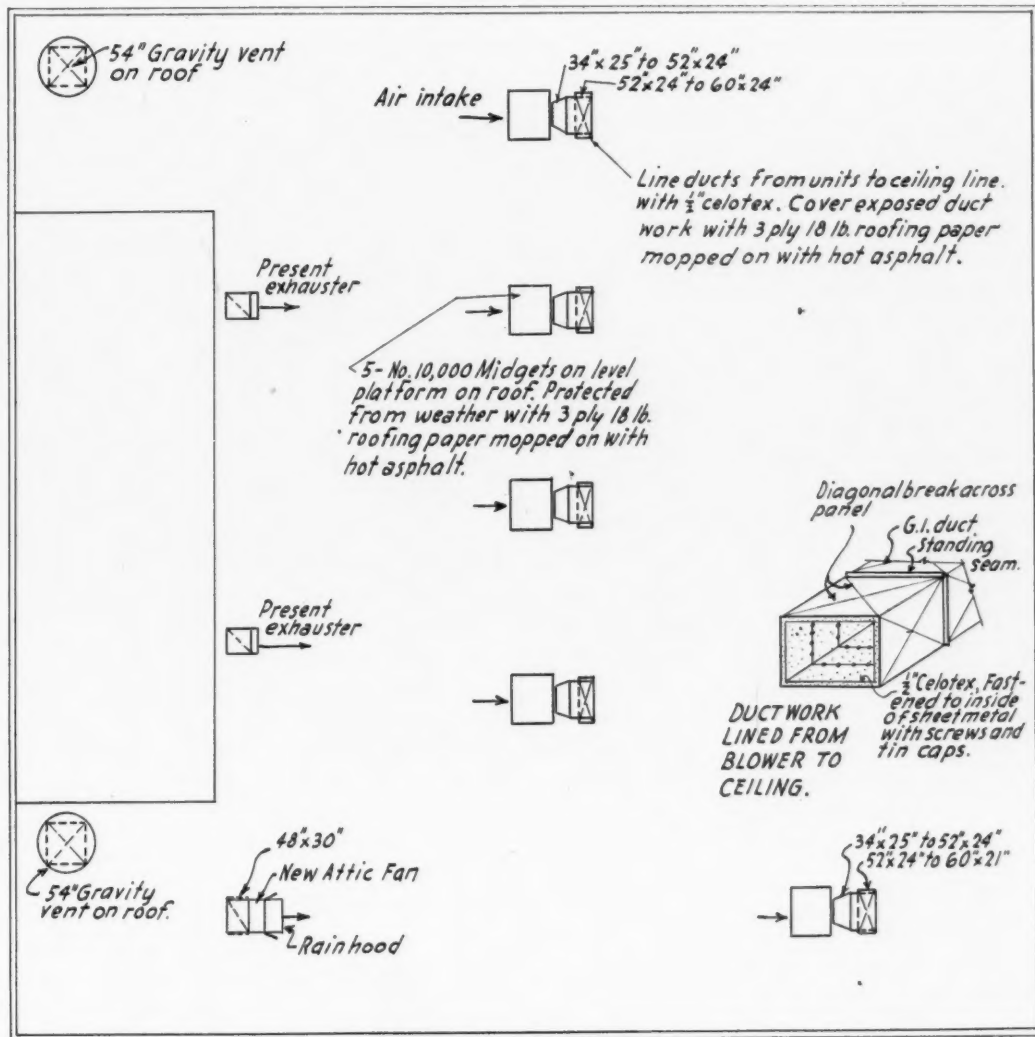
The installation was designed by the engineering department of United States Air Conditioning Corporation, Minneapolis, whose equipment was used and the company's Chicago distributor, National Air Control Company.

No mechanical refrigeration or ice or cold water is employed. Water from the city mains is piped to the tank in each unit and this water is recirculated again and again through the unit by a patented spray unit which delivers a vertical

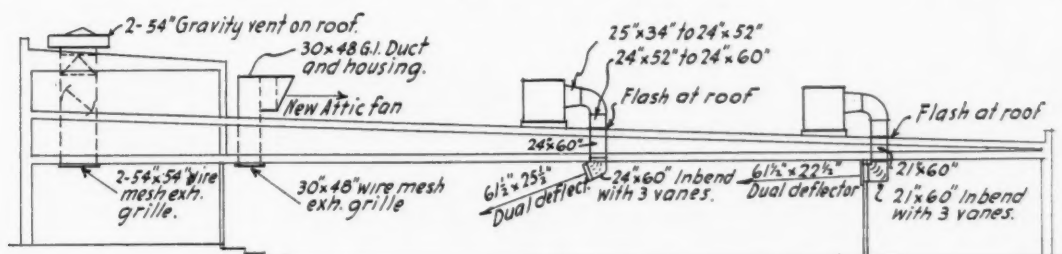
*(Continued on page 126)*



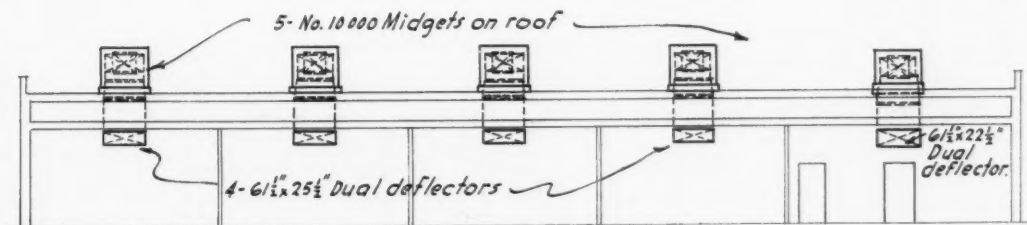
Exterior of the large Chicago recreation parlor where the bowling alleys are cooled by evaporative coolers.



ROOF PLAN



LONGITUDINAL SECTION



CROSS SECTION

DEGREE DAYS

[illegible]



# Technical Code—*Precalculated* [Part 7]

By Henry Aronson

Field Engineer, Premier Furnace Co.

ANY fuel consumption calculation is necessarily based on a great many "ifs." Using a degree day method is as accurate as any yet found. However, it must be borne in mind that it is accurate—only IF the heat loss figures are accurate; IF the inside temperature is maintained at 70 degrees; IF the resident of the house is not a fresh air fiend; IF the unit delivers at the capacity and efficiency estimated; and above all, IF the year is a normal one. So whenever called upon to give an estimate of fuel consumption be sure and qualify it.

To use this chart it is necessary to first determine the degree days. For example, assume 6500 degree days as an average for Illinois. As in this territory, the temperature difference for which jobs are figured, is 80 degrees, read down the 80-degree differential column in the left bank of indices to 6500. Then read across the column headed by the fuel and firing method as shown.

For instance, if the job is to be hand-fired, the requirements will be about 14.75 tons of 12,000 BTU coal for each 100,000 BTU heat loss. If it is on oil unit, 1850 gallons of No. 3 oil will be required. If it is a gas unit, 2430 therms of gas will be required.

These requirements will be for 100,000 BTU. If the heat loss is different, the result in quantity should be multiplied by the loss as expressed in units of 100,000. For example, if the actual loss is 140,000 the result would be multiplied by 1.4 (140,000 is  $1.4 \times 100,000$ ) and if the loss is

78,000, the multiplier will be .78.

The index on the right side of the bank of indices is for each 1000 BTU, per degree temperature difference. For instance, the heat loss is 70,000 BTU in a section where the temperature difference is only 50 degrees, which does not show on the chart. Divide 70,000 by 50 gives 1400 BTU per hour, per degree temperature difference. Assuming the degree days to be 3000, follow down the right hand index to this figure and read across. If a gas unit is to be figured it will be found that 900 therms will be required for each 1000 BTU per hour per degree temperature difference. As the requirements in this case are 1400 it will be necessary to multiply by 1.4 ( $1400 = 1.4 \times 1000$ ) to achieve the proper result which in this case will be 1260 therms of gas. A therm is, of course, 100,000 BTU of any kind of gas; natural, artificial or mixed and most gas companies selling heating gas by the therm.

## Cubical Contents—Infiltration Loss

A great many designers prefer to calculate infiltration losses on a basis of cubical contents, rather than by the crackage method. The chart on page 59 gives losses in BTU per hour, per degree temperature difference, for rooms of various cubical contents.

To use, find the cubical contents on the outer vertical scales, read across to the column headed by the determined hourly air changes, and find the result at the point of intersection.

This article concludes the series by Mr. Aronson which began in the November, 1940 issue. The original purpose of the series—to reduce the Technical Code to charts and tables so that no mathematics are needed—has been we think admirably fulfilled by the author. Readers who have hesitated to use the Technical Code because of its complexity should, now, be able to adopt the code at a minimum expense of time and effort. The author, we believe, will be happy to answer specific questions as readers put his tables and charts to actual use.

B.T.U. LOSS PER HR., PER DEG. TEMP. DIFF.

[illegible]

# B.T.U. LOSS PER HR., PER DEG TEMP DIFF.

Sq. Ft of Area		Coefficient "U"										Sq. Ft of Area	
		.62	.64	.66	.69	.71	.75	.78	.82	.86	1.06		
5	5	5	5	5	5	5	5	5	5	5	5	5	5
10	10	10	10	10	10	10	10	10	10	10	10	10	10
15	15	15	15	15	15	15	15	15	15	15	15	15	15
20	20	20	20	20	20	20	20	20	20	20	20	20	20
25	25	25	25	25	25	25	25	25	25	25	25	25	25
30	30	30	30	30	30	30	30	30	30	30	30	30	30
35	35	35	35	35	35	35	35	35	35	35	35	35	35
40	40	40	40	40	40	40	40	40	40	40	40	40	40
45	45	45	45	45	45	45	45	45	45	45	45	45	45
50	50	50	50	50	50	50	50	50	50	50	50	50	50
55	55	55	55	55	55	55	55	55	55	55	55	55	55
60	60	60	60	60	60	60	60	60	60	60	60	60	60
65	65	65	65	65	65	65	65	65	65	65	65	65	65
70	70	70	70	70	70	70	70	70	70	70	70	70	70
75	75	75	75	75	75	75	75	75	75	75	75	75	75
80	80	80	80	80	80	80	80	80	80	80	80	80	80
85	85	85	85	85	85	85	85	85	85	85	85	85	85
90	90	90	90	90	90	90	90	90	90	90	90	90	90
95	95	95	95	95	95	95	95	95	95	95	95	95	95
100	100	100	100	100	100	100	100	100	100	100	100	100	100
105	105	105	105	105	105	105	105	105	105	105	105	105	105
110	110	110	110	110	110	110	110	110	110	110	110	110	110
115	115	115	115	115	115	115	115	115	115	115	115	115	115
120	120	120	120	120	120	120	120	120	120	120	120	120	120
125	125	125	125	125	125	125	125	125	125	125	125	125	125
130	130	130	130	130	130	130	130	130	130	130	130	130	130
135	135	135	135	135	135	135	135	135	135	135	135	135	135
140	140	140	140	140	140	140	140	140	140	140	140	140	140
145	145	145	145	145	145	145	145	145	145	145	145	145	145
150	150	150	150	150	150	150	150	150	150	150	150	150	150
155	155	155	155	155	155	155	155	155	155	155	155	155	155
160	160	160	160	160	160	160	160	160	160	160	160	160	160
165	165	165	165	165	165	165	165	165	165	165	165	165	165
170	170	170	170	170	170	170	170	170	170	170	170	170	170
175	175	175	175	175	175	175	175	175	175	175	175	175	175
180	180	180	180	180	180	180	180	180	180	180	180	180	180
185	185	185	185	185	185	185	185	185	185	185	185	185	185
190	190	190	190	190	190	190	190	190	190	190	190	190	190
195	195	195	195	195	195	195	195	195	195	195	195	195	195
200	200	200	200	200	200	200	200	200	200	200	200	200	200

## B.T.U. PER HR., PER DEG. TEMP. DIFF.

Cubical Contents		Hourly Air Changes				Cubical Contents	
		1	2	3	4		
100	100	5	10	15	20	100	100
200	200	10	20	30	40	200	200
300	300	15	30	45	60	300	300
400	400	20	40	60	80	400	400
500	500	25	50	75	100	500	500
600	600	30	60	90	120	600	600
700	700	35	70	105	140	700	700
800	800	40	80	120	160	800	800
900	900	45	90	135	180	900	900
1000	1000	50	100	150	200	1000	1000
1100	1100	55	110	165	220	1100	1100
1200	1200	60	120	180	240	1200	1200
1300	1300	65	130	195	260	1300	1300
1400	1400	70	140	210	280	1400	1400
1500	1500	75	150	225	300	1500	1500
1600	1600	80	160	240	320	1600	1600
1700	1700	85	170	255	340	1700	1700
1800	1800	90	180	270	360	1800	1800
1900	1900	95	190	285	380	1900	1900
2000	2000	100	200	300	400	2000	2000
2100	2100	105	210	315	420	2100	2100
2200	2200	110	220	330	440	2200	2200
2300	2300	115	230	345	460	2300	2300
2400	2400	120	240	360	480	2400	2400
2500	2500	125	250	375	500	2500	2500
2600	2600	130	260	390	520	2600	2600
2700	2700	135	270	405	540	2700	2700
2800	2800	140	280	420	560	2800	2800
2900	2900	145	290	435	580	2900	2900
3000	3000	150	300	450	600	3000	3000
3100	3100	155	310	465	620	3100	3100
3200	3200	160	320	480	640	3200	3200
3300	3300	165	330	495	660	3300	3300
3400	3400	170	340	510	680	3400	3400
3500	3500	175	350	525	700	3500	3500
3600	3600	180	360	540	720	3600	3600
3700	3700	185	370	555	740	3700	3700
3800	3800	190	380	570	760	3800	3800
3900	3900	195	390	585	780	3900	3900
4000	4000	200	400	600	800	4000	4000

The page and one-half chart to the left (Btu Loss per Hour per Deg. Temp. Diff.) supplements other similar charts published previously. The table above (Btu per Hour per Deg. Temp. Diff.) is for use by those who prefer to calculate Infiltration by the cubical contents method rather than crackage method. The text explains the use.



# Zone Switchover Cools Individual Offices From a General Office System

By A. J. Rummel

Air Conditioning Engineer  
San Antonio Public Service Co.

THE installation of a unique system of air ducts and automatic controls allowing for zone switchovers as cooling and heating loads change, has eliminated complaints of "too hot" or "too cool" by occupants of individual offices being supplied air from the same zone ducts that supply conditioned air to the large open office spaces in the main office building of the San Antonio Public Service Company, San Antonio, Texas.

In this six story general office building, requiring 120 tons of refrigeration for cooling, the third floor is occupied by the accounting department and the company's executive offices. The executive offices, being located at the east end of the building and subject to different exposure and internal load conditions, have periods of maximum heating and cooling requirements quite different from the other portions of the same floor.

The difficulty of maintaining proper temperature conditions in these individual offices, as shown in Fig. 1, is apparent when the distribution of lighting, exposure, and human occupancy loads in the open office spaces are analyzed. Of the 52 employees regularly employed on this floor, 40 are located on the south side of the floor and only 12 on the north side; also, of a total of 35,000 watts of lighting, 28,000 watts are on the south side and 7,000 on the north side. This uneven distribution of load often requires cooling in the south zone

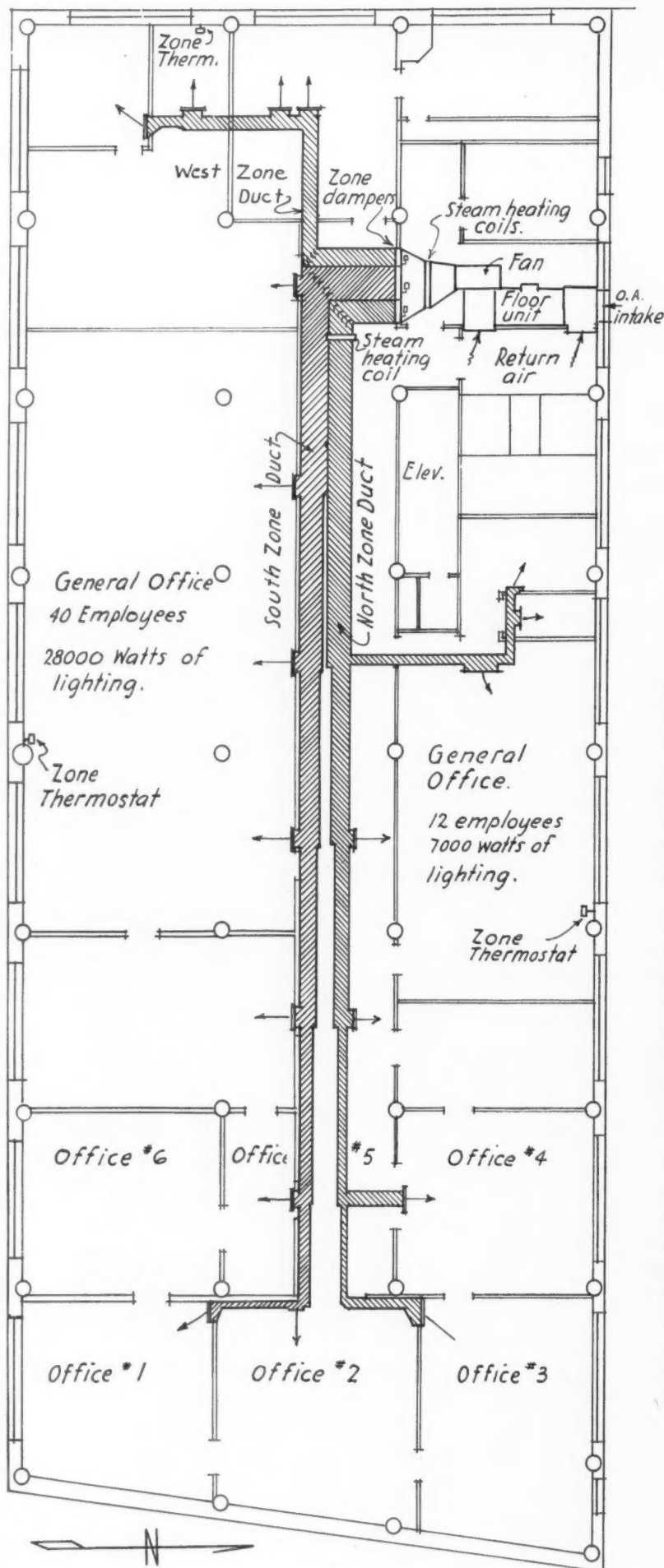


Fig. 1—General layout of offices and original air conditioning system. Variations in exposure, occupancy, and heat load often made cooling in south zone necessary when heating was called for in the north zone.

during the fall and winter months while heating is required in the north zone.

### Original System Operation

The air distribution system for this floor as originally installed was divided into three zones as shown in Fig. 1. In summer, a total of approximately 9,400 cfm of cooled air is distributed through these three zone ducts. The air is cooled and dehumidified in a floor dehumidifier and cooler supplied with cold water from a water cooler in the basement. The supply of air to each zone is controlled by a motor operated zone damper actuated by a thermostat located in each zone.

In winter the air supplied all zones is heated by a steam heating coil located at the fan outlet and the north zone air is further heated by a separate steam heating coil located in the north zone duct as shown in Fig. 1. The operation of the steam heating coil in the north zone duct is controlled by the north zone thermostat and its operation is independent of the operation of the main heating coil or the heating requirements of the other zones. The temperature of the air leaving the main steam coil supplying all zones is approximately 105°F, while the temperature of the air leaving the steam coil in the north zone duct is about 120°F. With this arrangement it is possible to supply the north, or coldest, zone with more heat or to continue the supply of heat even though the other zones have been satisfied.

Since, in the original installation, the individual executive office number 1, located at the southeast

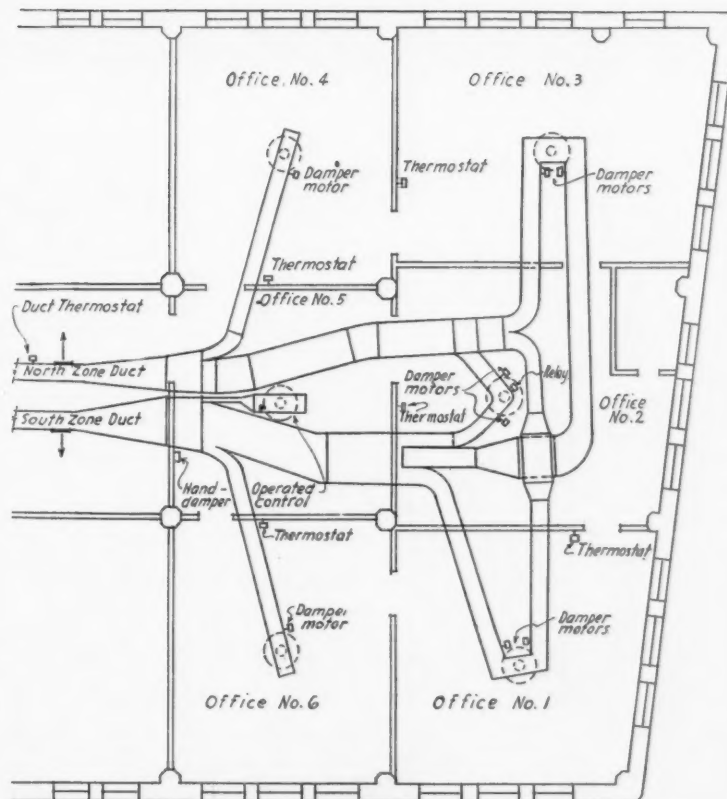


Fig. 2—Cross-connecting duct system as revised makes available either heating or cooling irrespective of the general system operation. Proper temperature can be maintained in the problem spaces at any time of the year.

corner, was connected to the south zone duct, the warm air supply to this office in winter was often cut off before the office was sufficiently heated. The northeast corner office (number 3) was connected to the north zone duct and in summer this office was often not sufficiently cooled before the north zone thermostat cut off the cool air supply to this zone. This condition was remedied by the installation of the cross-connecting duct system shown in Fig. 2.

With this arrangement proper temperature air is automatically supplied these offices from either the north or south zones as required. The thermostats located in offices numbers 1, 2, and 3 control the operation of damper motors supplying air to the offices from either the north or south zone ducts.

Located in the north zone duct is a duct thermostat as shown in Fig. 2. This thermostat is set at 100° F. at which temperature it closes a relay making connection with the thermostat in office number 1. In winter when this office requires heating, and the temperature of the air in the north zone duct is above 100° F., the thermostat located in office number 1 actuates the damper motor opening the north zone damper allowing heated air to enter the office from the north zone duct. In this position the electric circuit to

(Continued on page 130)

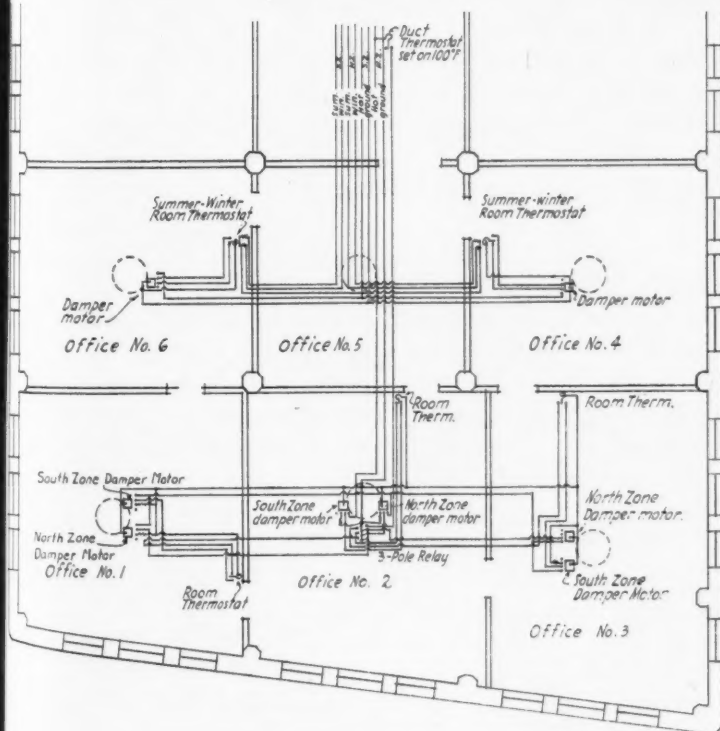


Fig. 3—Wiring diagram showing inter-instrument connections which operate the revised system.

# Pattern Development for

## Air Conditioning Fittings \*

By William Neubecker

Head Instructor

Sheet Metal Department, New York Trade School

### Three Piece Offset—Rectangular to Rectangular

#### Three-Piece Offset, Rectangular to Rectangular in Reversed Positions

Fig. 51 shows the method of developing the various pattern shapes for a three piece offset rectangular to rectangular, with the sections placed in reversed positions as shown by  $A$  at the top, in elevation, and at the bottom by  $A^\circ$ . This same method, which will follow, can also be applied when the section on one end is rectangular and the other end is square.

Draw the rectangular section  $A$  in the side elevation as shown by 1-2-3-4. From 4 draw the horizontal line 4- $a$  on which set off the desired distance  $B-C$  also the horizontal length of the transition as  $C-A$ . From  $a$  draw the perpendicular line  $a-D$  which represents the drop and from  $D$  draw the horizontal line  $D-E$  as desired. Draw a line from  $C$  to  $D$ .

To obtain the correct miter lines between the three pieces, bisect the angles  $B-C-D$  and  $C-D-E$  as follows: With  $C$  as center and any desired radius describe arcs intersecting the angle  $B-C-D$  at  $e$  and  $f$ . Using  $e$  and  $f$  as centers with the same or any other radius describe arcs intersecting each other at  $i$ . Draw the miter line from  $C$ , through  $i$  indefinitely. In a similar manner using  $D$  as center with any radius describe arcs intersecting the angle  $C-D-E$  at  $b$  and  $c$ . Using  $b$  and  $c$  as centers with any radius intersect arc at  $d$ . Draw the miter line  $d-D$  extending it indefinitely.

At right angles to  $D-E$  in the side elevation draw the line  $E-F$  equal to the narrow side of the rectangle shown in sections  $A$  or  $A^\circ$ . From  $F$  draw a line parallel to  $D-E$  to intersect the miter line at  $G$ . From  $J$  draw a line parallel to  $B-C$  to meet the miter line at  $H$ . Draw a line from  $H$  to  $G$  which completes the side elevation. The front elevation which is shown is not necessary in the development of the patterns.

To obtain the pattern for the upper piece

marked  $X$  in side elevation, take the girth of section  $A$  and set it off at the lower right as shown by similar numbers on the line 1-1. From these figures erect perpendicular lines indefinitely. Now measuring in each instance from the line  $B-J$  in side elevation, take the distance from  $J$  to  $H$  which represents points 1 and 2 in profile  $A$  and set it off in the pattern for  $X$  on lines drawn from 1-2 and 1, measuring in each instance from the line 1-1. In a similar manner take the distance in side elevation from  $B$  to  $C$  which represents points 3 and 4 in section  $A$  and set it off in the pattern for  $X$ , measuring from the line 1-1 on lines drawn from 3 and 4. Connect these intersections by lines as shown, then will  $K-L-M-1-1$  be the net pattern for the upper piece  $X$  in side elevation.

The same girth 1 to 1 which was used for pattern for  $X$  could be used for pattern for  $Y$ , but to avoid confusion and to make each step clear, section  $A^\circ$  in front elevation has been renumbered as shown from 1° to 4° and this girth has been placed on the horizontal line 1°-1° in pattern for  $Y$ .

Now measuring in each instance from the line  $E-F$  in side elevation take the distance from  $F$  to  $G$  which represents points 1° and 2° also the distance from  $E$  to  $D$  which represents points 3° and 4° in the section  $A^\circ$  and set them off in pattern for  $Y$  on similar numbered lines erected at right angles to 1°-1°. Draw lines from intersections so obtained then will  $O-P-R-1^\circ-1^\circ$  be the net pattern for the piece  $Y$  in side elevation.

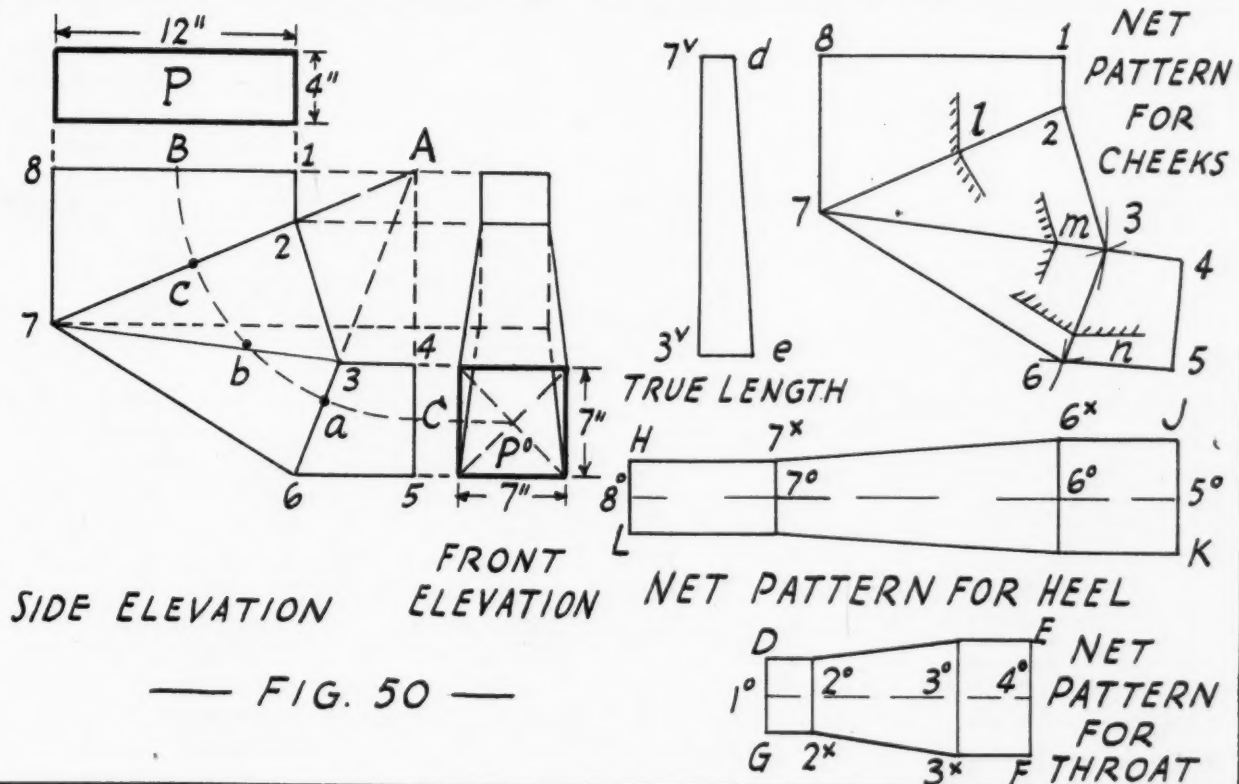
The next step is to obtain the half pattern for the bottom  $H-G$  of the center transition in elevation as follows: Set off  $H-G$  on the horizontal line  $H^\circ-G^\circ$  at the right. From  $H^\circ$  and  $G^\circ$  drop vertical lines, making  $H^\circ-H^\circ$  and  $G^\circ-G^\circ$  equal respectively to one half of the narrow side and one half of the wide side of either sections  $A$  or  $A^\circ$ . Draw a line from  $H^\circ$  to  $G^\circ$  in the half pat-

(Continued on page 121)

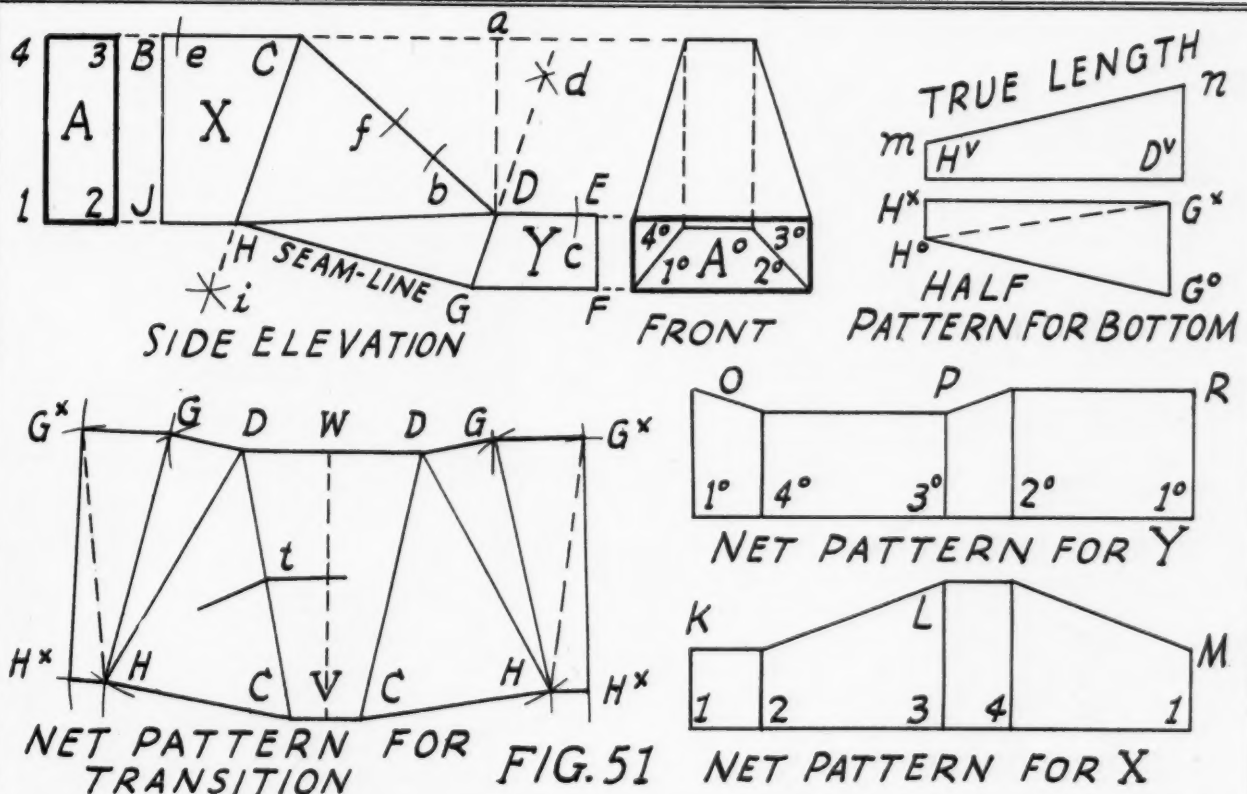
\*All rights reserved.



# PATTERNS FOR THREE PIECED ELBOW RECTANGULAR TO SQUARE



# PATTERNS FOR THREE PIECED OFF SET RECTANGULAR TO RECTANGULAR



# Outside Riser Eliminates Extensive Inside Alterations



SWANDA BROTHERS, Oklahoma City sheet metal contractors and the Oklahoma City office of the York Ice Machinery Co., last year installed a cooling system in a local bank's quarters where available space necessitated an outside riser to reach the two floors cooled. Equipment was installed in the basement and the supply riser was carried up through an air intake used with a previous ventilating system.

From the outside riser two supply mains are hung below the ceiling, exposed, to the column line down the center of each floor. The mains then follow the column line with supply grilles opening to outside walls along the length of the main. Each main thus supplies cooled air to the space between the center column line and the facing outside wall.

To obtain uniform air delivery and "carry"

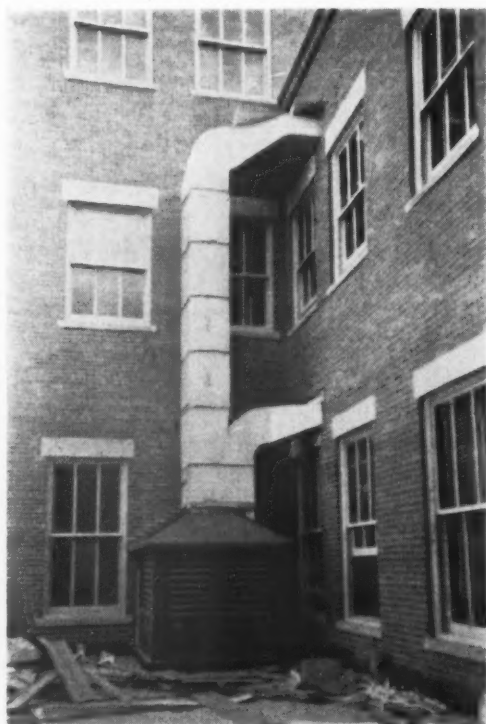
Swanda fabricated special multi-blade deflector sections to take the designed air volume out of the main at each grille.

In the contract, some 14,000 pounds of galvanized iron were required in 26, 24 and 22 gauge for ducts up to 16 inches, 18 to 30 inches and 30 to 60 inches respectively. Measurements for ducts and fittings were made on the job. Small ducts were made in 10-foot lengths complete ready to hang. Larger ducts were made in 3-foot panels joined with government locks.

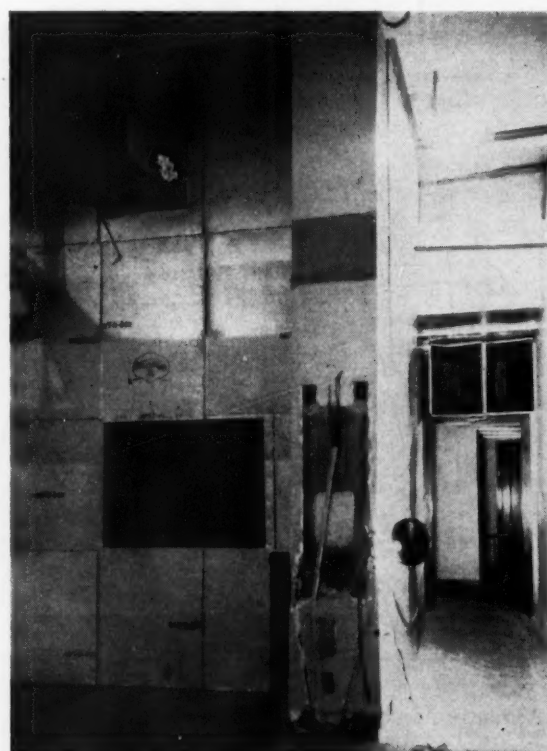
The large outside supply riser was assembled as individual sheets in 3-foot lengths, each panel cross broken. Connections are government locks. These locks support the 2-inch slab insulation with metal screws and large disk washers used to hold insulation to the panels. The riser is self supporting.

A new supply fan was installed in the basement in a special housing as shown in a photograph.

(Continued on page 124)



At top—View of banking quarters showing double supply ducts and duct grilles with directional flow faces. The main running left comes from the outside riser. At left—Outside supply riser coming up through existing air shaft. This duct is insulated. At right—Basement blower and coil housing which is also a supply plenum. Ducts in background lead to the outside riser.



# The Installation and Use of Attic Fans

## [Part 2]

The Engineering Experiment Station of the Agricultural and Mechanical College of Texas has conducted considerable research on attic and window fans—their costs, results, practicability. This research has covered both laboratory and field installations. From the data gathered the college has published Bulletin 52. Part I of this series appeared in the April issue.

Other articles will follow.

### 1. Locating the Fan

THE location of the fan will depend first upon the position of the ceiling grille. The ideal location of the ceiling grille and fan unit is shown in the floor plan of Fig. 2 with the grille located in the ceiling of a central hall, thus affording ready distribution and flexible control of air movement throughout the entire house. It is preferable that the fan be placed over or near a partition wall or other solid support in order to prevent undue sagging of the ceiling and excessive vibration. An excellent location is over a closet

The fan should never be less than three feet from the nearest side of the ceiling grille. If a fan is located too close to the grille opening, air and

fan noises may prove objectionable. The farther back from the opening the fan is located, ordinarily the quieter the installation. However, for greatest economy, it is usually satisfactory to place the fan one fan diameter from the nearest side of the grille. Thus, if the blade diameter of the fan is 42 inches, the fan should be located not less than 42 inches from the nearest side of the grille.

### Locate Fan Carefully

If it can be avoided, never locate the fan facing toward an attic window or louver opening. This prevents light from shining through the fan into the vent box and flickering in the room below. The exhaust side of the fan should be free from obstructions; that is, the fan should not blow directly against any object such as the walls, the roof, or a chimney. To do so would build up a back pressure which would reduce the efficiency of the fan, thus increasing the cost of operation, and probably would increase the noise level to objectionable proportions. If the clearance on the exhaust side of the fan is less than five feet, curved baffles, such as are used in Fig. 14, are suggested to direct the air past the obstruction and reduce resistance. The fan should be so

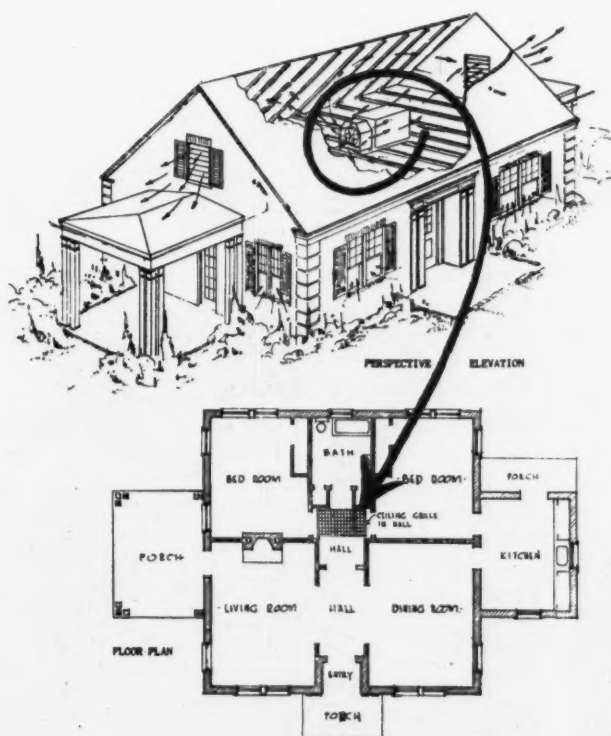


Fig. 2—Typical one-story house installation with central grille and exhaust through gable louvers. The attic is cooled along with the house in this type of installation. (American Blower Corp.)

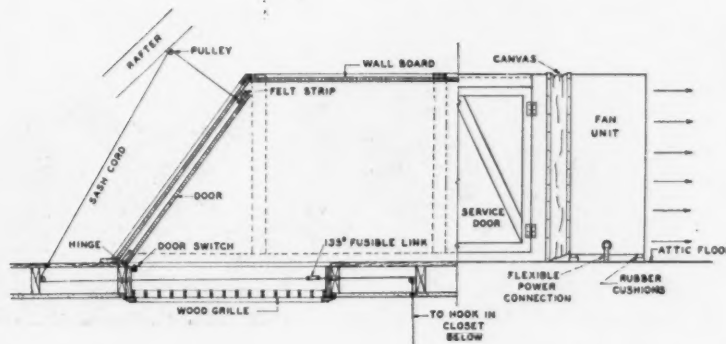
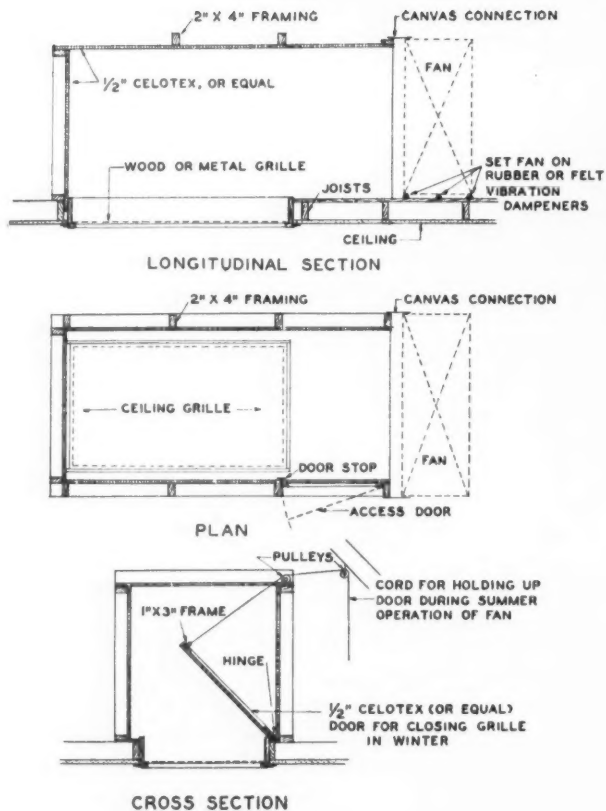


Fig. 3—Construction details of a suction box. Note framing on outside to reduce friction. Note hinged trap and fusible link to close grille in case of fire.





placed in the attic that the air will be circulated as much as possible before it escapes through the exhaust openings. That is, if the fan is faced away from the exhaust opening, it will more completely sweep the hot, dead air from even the remote corners of the attic. Never place the fan at an angle to the direction of air flow through the suction chamber. To do so may cause an unbalanced load on the fan blades which often results in a "beat noise."

## 2. Suction Boxes

Different structural conditions encountered in homes do not permit a set rule for suction box construction. It is most practical to have the carpenter or installer work out details of construction for each particular job. However, a few general principles should be observed in building a suction box. The cross section of the box should

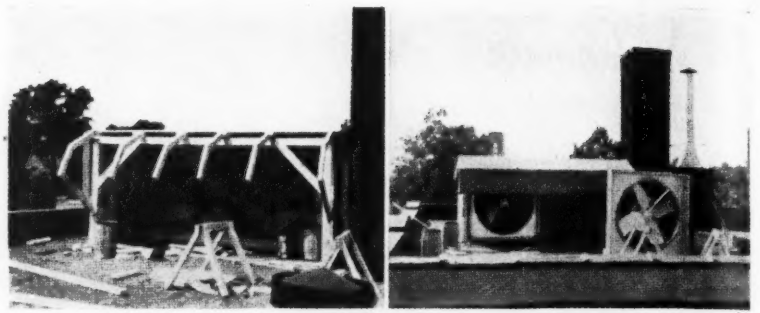


Fig. 6 (left)—A hooded penthouse for twin fans in construction. See Fig. 8 also. Fig. 7 (right)—Further details of construction for a twin fan penthouse. (Both photos by Hunter Fan & Ventilating Co.)

Left—Fig. 5—Additional details showing construction of a suction box. Note location of fan from grille to reduce noise and improve air characteristics.

be as large as the intake grille opening or the discharge opening, for if air moves through the box at too high a velocity it will produce an objectionable rushing sound. The cross section of the chamber should never be less than the area of the fan itself. All framing members should be placed on the outside of the box, for if placed inside, they will retard the air movement, thus increasing resistance to air flow and creating disturbing cross- or eddy-currents. A sound absorbing material such as rigid insulating board is recommended for suction box walls.

The ceiling grille opening, whether of the automatic closing type or of the open type, should be covered by a manually operated trap door, hinged into the back or floor of the suction box as illustrated in Figs. 3 and 5. It is not satisfactory to use this door both as the back of the box and also as the trap door. This cover may be used both as a fire door and as a closing for the ceiling grille in the winter. For the latter type of operation, the cover may be lowered by means of a rope

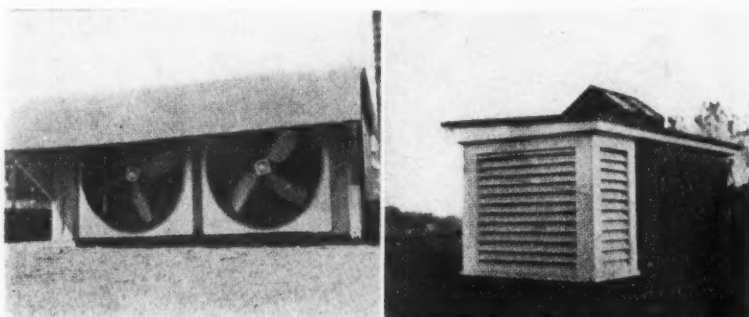


Fig. 8 (left)—A hooded penthouse twin fan installation. Fig. 9 (right)—A louvred penthouse built of wood. One louvre should be removable for access to fan. (Both photos from Hunter Fan & Ventilating Co.)

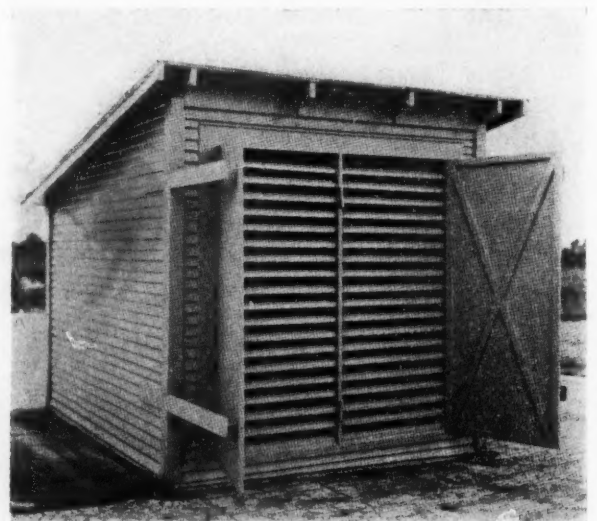


Fig. 10—Large penthouse with one face a louvre. Manually opened doors. (Photo by Schwitzer-Cummins Co.)

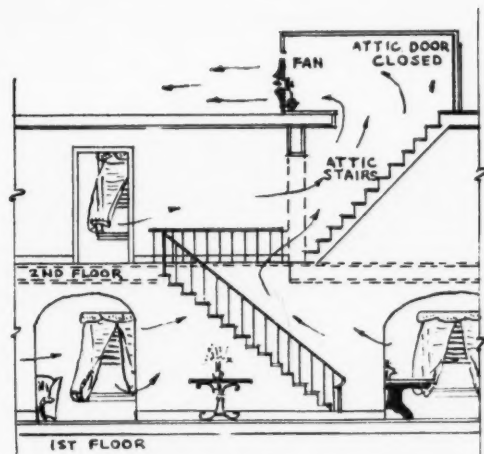


Fig. 11—Fan installed over stairway. The fan housing is in the attic. Must have door opening into attic.

and pulley from a closet on the floor below. For use as a fire door, a 135 to 150 degree F fusible link should be inserted in the pull cord so that the door will close automatically in the event of a fire inside the house. Either type of installation should be equipped with an automatic shut-off or a safety switch which stops the motor when the trap door is lowered. The suction box should be provided with a service access door as indicated in Fig. 3.

In many instances it will be necessary to vary the design of the suction box to suit the structural details of the house. Frequently a low roof will make it necessary to omit the top of the box. Then the sides of such a box are extended to the roof which serves as the top of the box. The underside of the roof should be sealed with fiber board to prevent excessive air infiltration which reduces the efficiency of the installation.

Usually flat-roofed houses need the ventilation and cooling advantages of an attic fan system more than any other type because of the extreme

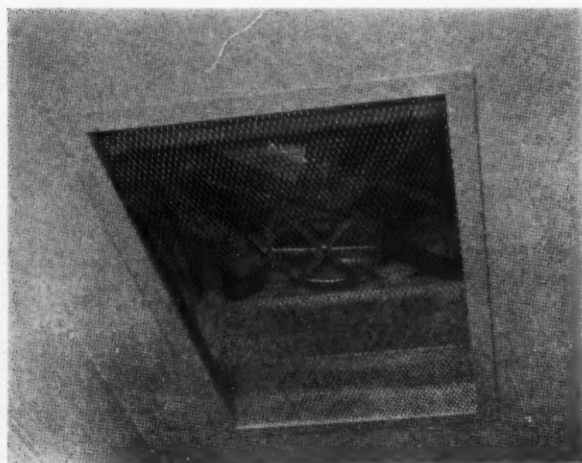


Fig. 13—Looking up into a vertically mounted exhaust fan. See Figs. 14 and 12, also. (Photo by Hunter Fan & Ventilating Co.)

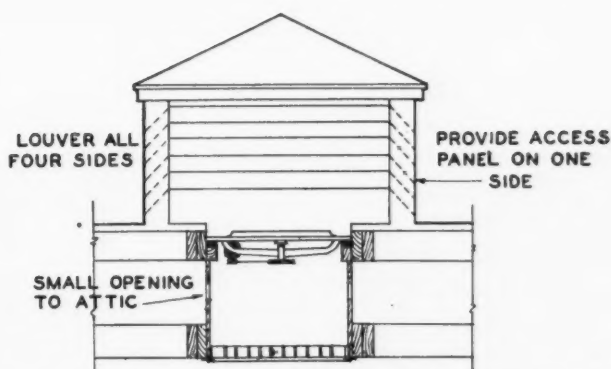


Fig. 12—Vertical exhaust installation for a shallow attic. Fan discharges into penthouse.

radiation of heat from the roof directly into the rooms below. A penthouse of wood or metal may be constructed over a centrally located grille as illustrated in Figs. 6, 7, 8, and 9. In this type of installation the fan exhausts directly into the outdoors through a hooded or louvered opening.

Another type of penthouse installation for flat-roof construction with low attic space is shown in Fig. 10, which is a commercial installation in a roadside "nite club."

In houses which have a stairway to the attic it may be desirable to locate the suction box over the stairs as illustrated in Fig. 11.

Vertical installations, that is, those which discharge air vertically, are sometimes required on buildings with flat roofs where it is necessary to have a low penthouse which cannot be seen from the ground. This type of installation is illustrated in Figs. 12 and 13. The penthouse has louvers on all four sides, and one louver should be removable for servicing.

Another method of installation for flat-roof construction where it is not desirable to use a penthouse is illustrated in Fig. 14 in which one or more metal roof ventilators are employed. If this attic space is low, a diffuser of metal or wall board should be used as indicated in order that resistance to air flow and back pressure may be reduced to a minimum. Fig. 15 illustrates a method of constructing a door for closing the

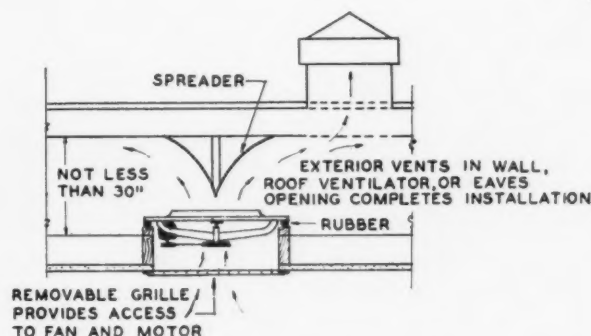


Fig. 14—Rotary, vertically mounted fan in shallow attic with air spreader to reduce resistance and direct air flow from fan.

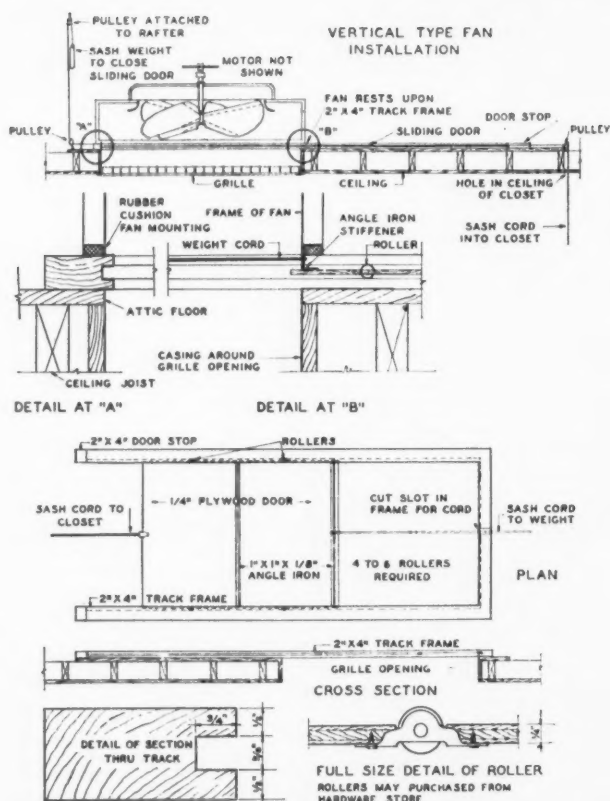


Fig. 15—Construction details of a track mounted fan and door above grille.

ceiling grille opening when a vertical discharge fan is used.

Every effort should be made to avoid vertical installations in residences, because air and mechanical noises usually prove objectionable with the fan installed directly above the ceiling grille. For vertical use, both fan bearings and motor bearings must be capable of taking a thrust load, and the fan should be purchased with the understanding that it will be operated with the motor and fan shafts in a vertical position.

In two-story apartment houses, the apartment on the lower floor usually does not have access to the attic. In such cases it is often possible to locate the fan underneath the floor using the lower portion of a closet for the intake to the suction box. Adequate exhaust openings must, of course, be provided in the foundation walls to the outside. In other instances it may be necessary to locate the suction box of the fan serving the lower floor apartment as shown in Fig. 16. This closet must be closed permanently and made airtight so that it serves as a connecting duct from the intake grille of the first floor ceiling and the suction box above. In installations of this type it is necessary to provide shutters or automatic doors for each fan to prevent one fan from forcing hot air into the other apartment when its fan is not operating. The installation for the apartment on the second floor can be made in the conventional manner.

The suction box should be the length of the ceil-

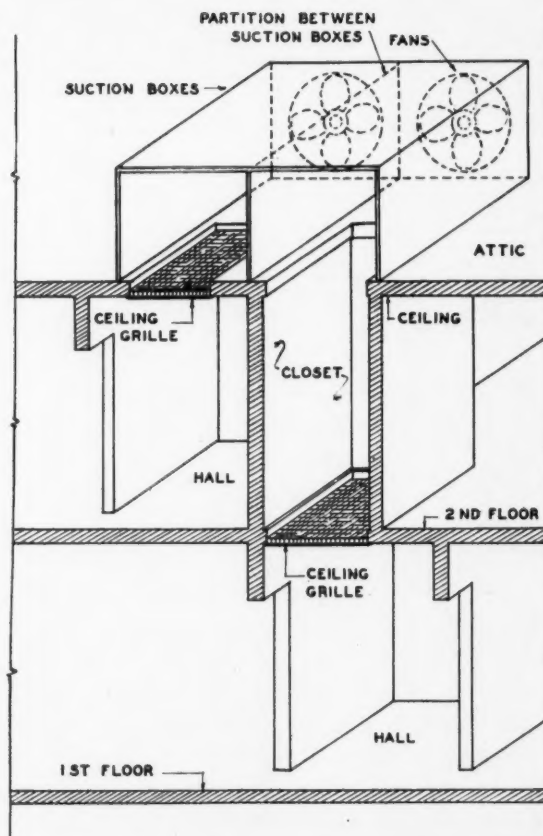


Fig. 16—Suction boxes for a two-story apartment installation. Closets are used as air passages. The closet must be permanently closed and air tight for good operation.

ing grille plus not less than one diameter of the fan. Its height and width are governed by the size of the frame carrying the fan assembly. Should the ceiling grille be wider than the fan assembly, the suction box should be made the width of the grille. For maximum efficiency the box should be as nearly airtight as possible, and all joints, cracks, and corners should be sealed with heavy gummed kraft paper. If light reflections

(Continued on page 124)

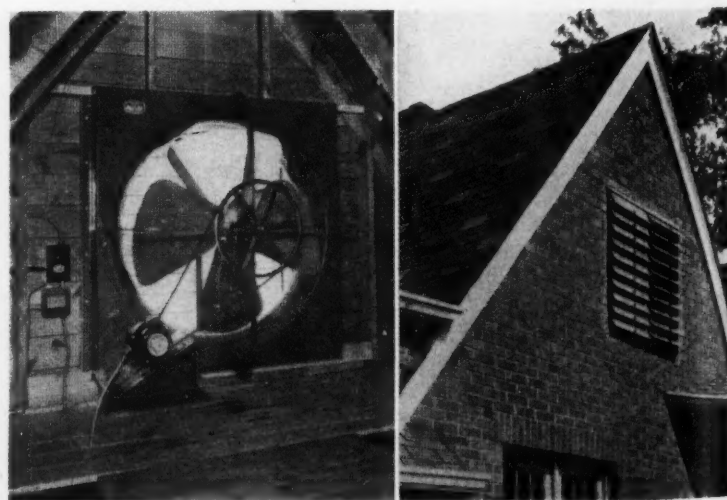


Fig. 17 (left)—Fan mounted in attic gable wall. Suitable only in tight attics. House and attic air exhausted simultaneously. Fig. 18 (right)—Automatic louvers for gable mounted fan. Blades close by gravity when fan is not running. (Both photos by Schwitzer-Cummins Co.)



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# SHEET METAL

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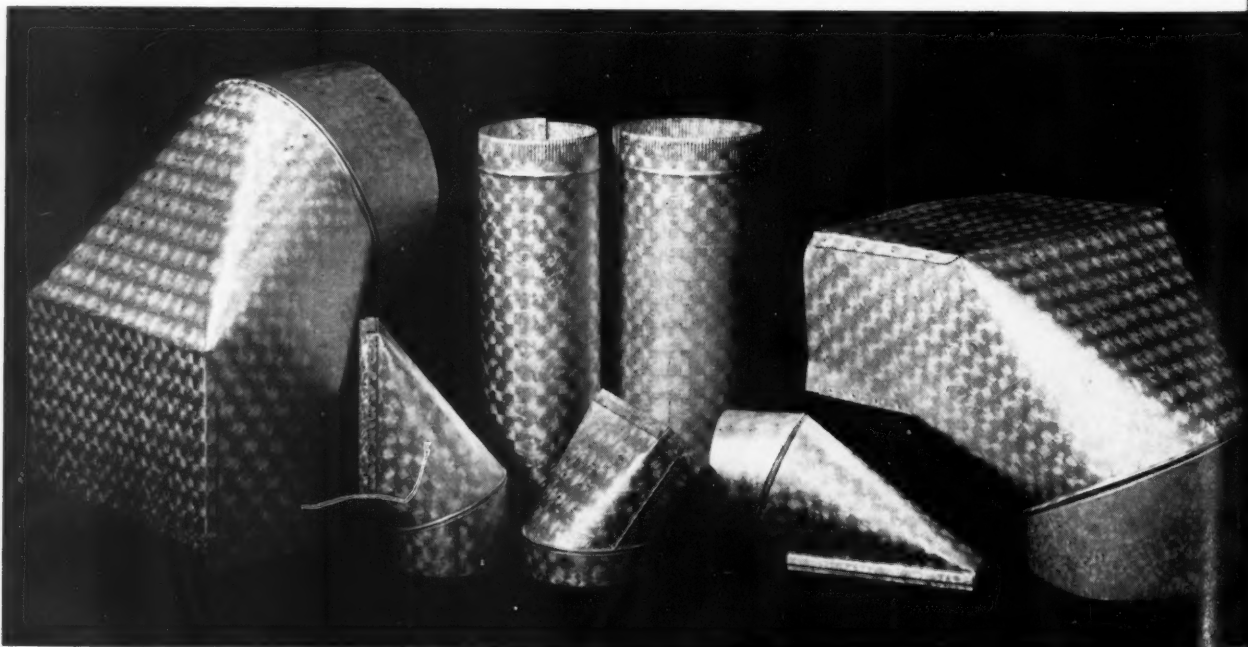
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O P E N   H E A R T H   S T E E L   S U C C E S S



# 7 Steps to

## "Streamlined" Sheet Metal Training

By Ernest E. Zideck

Instructor, Technical School, Jackson, Michigan

**S**HEET METAL fabricating is the work of converting flat sheets of metal (be the sheets tinned, galvanized or plain steel and be they thin as paper or thick as plate) to forms and shapes and assemblies by the use of tools and machines without changing the nature of the metal; that is, without heating it, like a blacksmith used to do, or melting it, like a foundry does. And all sheet metal work, be it called tinsmithing as of old, or be it the building of cars and planes as of new, consists of seven distinct steps, which in their order are: 1—Planning; 2—Layout; 3—Shearing; 4—Provisioning; 5—Forming; 6—Joining; 7—Finishing.

Before we may lay-out anything for shearing and further processing we need a Plan—a sketch, a picture, a blue print and a specification or at least an idea of what the item or the article is to be like; what purpose it is to serve; and in what dimensions or capacities it is desired. And before we can shear the sheet we must have the *layout* of the article or part. The layout may be simple, but we must at least know the size of the metal piece which we require for the item we intend to make. After cutting the sheet *economically*, obtaining the desired size blank without wasting the metal, we must make certain provisions in the blank—such as notches for joining, marks for forming, punching of holes for bolts or rivets, if any, and do all this work "in flat;" that is, before the metal is braked or rolled to form.

Sheet metal work differs from wood work or solid steel machining in that we can not obtain the form desired by *shaving off* the surplus, doing so gradually, by thousands of an inch in the final phase of the work, as is done in solids, the process resulting in a tool or die or a part of furniture shaped to close dimensions and snugly fitting all other parts. In sheet metal we obtain the close fitting form or part by figuring the metal in flat; that is, how much of its surface it will take to obtain a certain diameter round pipe or a certain dimensioned square post or a certain size radial

or angular formation that will fit in with other items of the kind.

As it is practically impossible to do this figuring and multiple, accurate provisioning offhand by taking the sheared blank and marking it for notching and other provisions one by one as the piece is being formed; and as this procedure would require much more time and invariably result in misfits—the preferred and adhered to procedure in *legitimate* sheet metal working is to **FIRST** lay-out a **PATTERN** for the item or part and do the notching and provisioning and forming by transferring the markings from the pattern to the blank. If there are a number of identical items or parts to be made, we use the patterns for setting the gauges on the shears, the notching and punching presses and the brakes. This does away with marking each blank separately or shearing the blanks by the use of a ruler or other less dependable measuring methods.

### Pattern Cutting Has No Shortcut

The art of pattern-making in sheet metal work, especially if the patterns are to be used in producing a great number of parts which then are assembled into the article manufactured; and more so if the parts are produced in quantities resulting in **MANY** units of the manufactured article; that art may not be learned or mastered in a few weeks or months of instruction, and not without previous drafting or blue print reading experience. Patently in Quantity Production of large assemblies such as diverse cabinets and more so in the manufacture of cars and planes it is necessary that the layout man and the patternmaker understand the blue print and the specification, know all about sheet metal gauges and is an expert in figuring gains obtained from metal thicknesses, losses caused by certain metal shrinkages and variations in placement of provisions caused by multiple bends or radial formations of the sheet.



## "Streamlined" Production Training

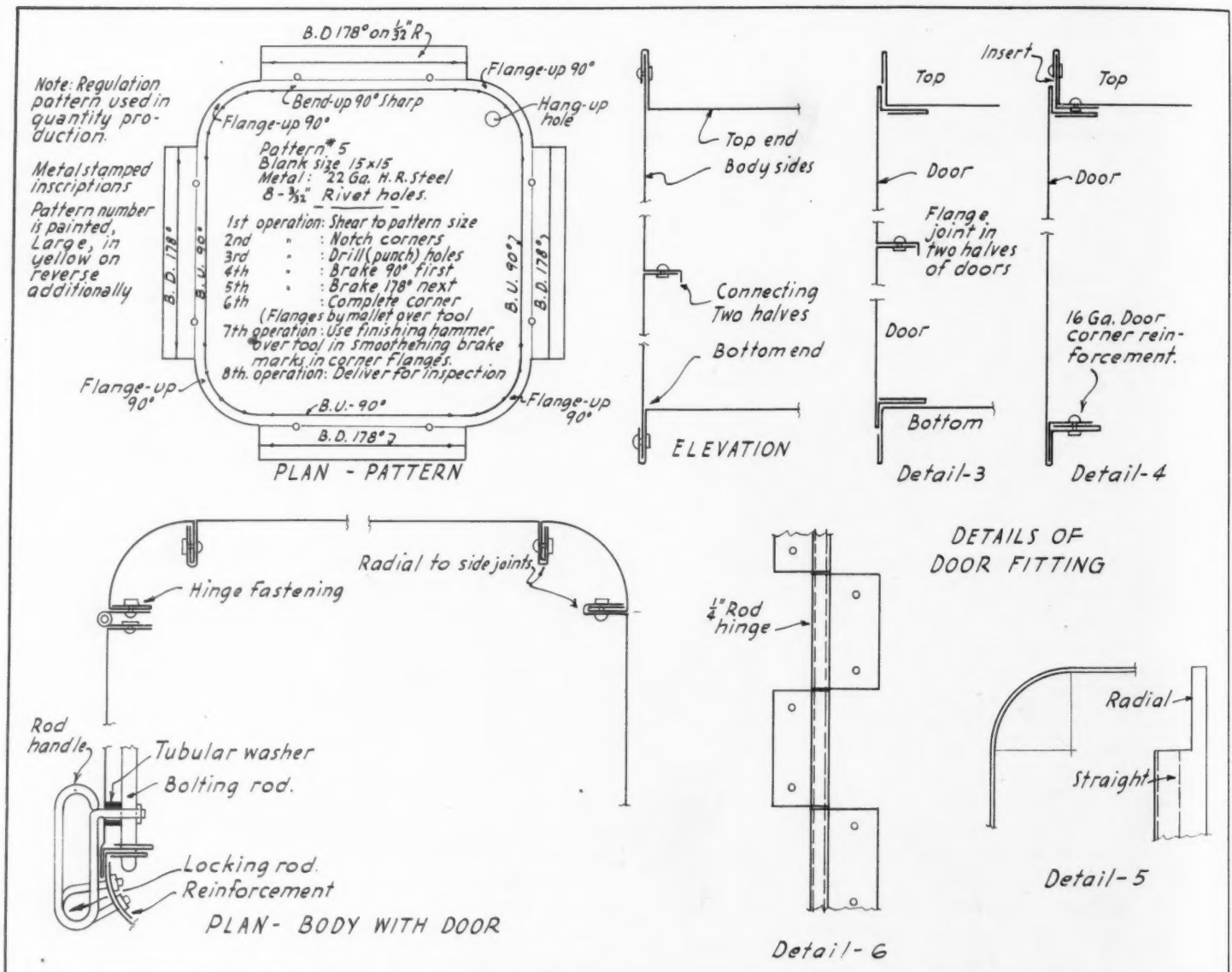
In consequence, in the training of men for sheet metal work under the present emergency we must abandon the effort to teach this sort of layout and patternmaking and concentrate on teaching the other operations, namely: shearing by the pattern; provisioning by the pattern; forming by the pattern or the template; the fitting of formed parts by the use of handtools, for assembly; assembly work itself; and making ready for joining by means of welding or brazing and again for abrasive and final finishing.

Instructors in the Public School Vocational System complain that their equipment in tools and machinery is too meagre for work other than the conventional, individualized making of trinkets and small home utensils. Such equipment usually consists of the following: a three-foot squaring shears; a three-foot roller; a 30-inch

folder; a four-foot brake; an assortment of small burring, beading, crimping and wiring machines; a bench-mounted drill press; an emery wheel; a soldering outfit; a whole assortment, doubled and trebled in many cases, of mandrels, stakes, all sorts of handtools and such like. True, the equipment in ninety cases out of a hundred is badly run down; the green students misuse the tools shamefully and no one is there to keep the equipment in good working order.

Another complaint—more justified—is the difficulty the instructor has in obtaining materials for more than the conventional making of small tinware or pipe or elbow. And, in any attempt at teaching quantity shearing, provisioning, forming, fitting and assembly, plenty of sheets must be forthcoming.

Under the National Defense priority rulings restrictions have been imposed on tools and machines for school use. But no such restrictions



The details above show the production-type locker described and discussed by the author. Some of the features (like upper and lower halves) are necessary because of small equipment commonly found in training shops. This locker, states Mr. Zideck, trains the student in all seven common production operations.

as yet pertain to sheets. The allowances in materials by far exceed anything which the twenty-odd students in the class room could work up—if the working up of the sheets is done with a plan, by patterns, the production resulting in items for use. (But, no competitive goods must be produced.)

The problem may be solved by producing special lockers for school use. Hundreds of such lockers may be placed in the school buildings of most communities. And as the lockers are not offered for sale, no complaints from firms manufacturing lockers or from labor unions may be expected. Such a locker embodies all the features of sheet metal fabrication; all features of quantity production. Distinct operations on the squaring shears, on the rollers and the brake, on the folder and the flanging machines, on the drill press, the fitting of parts on the stakes, hand notching, hand-fitting, riveting and seaming and making ready for welding or brazing and for final finishing are feasible with the conventional school-shop equipment.

Obviously, the instructor is called upon to prepare a Plan of the Locker or cabinet; make an assembly drawing; divide the assembly into that many parts (as feasible to be produced by the students and with the equipment at hand), and make at least paper-layouts by which the more advanced or capable students may make regular sheet metal patterns.

#### Locker Circumscribed by School Equipment

A school locker of this kind as fabricated by one school will be described. Owing to the shears and the other machines being too short to operate 5-foot long blanks on them, the whole cabinet was made of two halves, the halves partly riveted and partly bolted together after formation. The principal construction consisted of four corner posts, which for rigidity and to provide roller exercise for the students, were made radial. The blank was cut 5 by 30 inches, to obtain the greatest possible number of pieces out of a sheet without waste. The middle 3 inches were marked for radial formation, with one inch at each side for brake formations. Notching was done for the 1-inch lap by which the two halves were joined together, making the completed post 59 inches high. Notching was also done on the bottom and the top ends of the post eliminating the inward protruding braking formation of 1 inch down from the top end and 1 inch up from the base end of the post.

Radial formation (in the rollers) was completed first. Then the inward  $\frac{1}{2}$ -inch wide flange was braked to 180 degrees and this was braked, again inward of the post, to 90 degrees. This construction resulted in a rigid post, the 90-degree braked flanges strong enough to hold hinges

for the door, strong enough for the bolting lock to hold, and in other respects to provide rigid anchorage for the three walls that hooked over the flanges and were riveted or bolted, on the inside of the cabinet, to them.

The bottom and the top of the locker were constructed in a manner of "set-in" ends familiar to the trade. The pattern was 15 by 15 inches square, all four sides of the blank marked with dots for  $\frac{1}{2}$ -inch and then for 1-inch brakings, with the corners marked off on a 2-inch radius, a  $\frac{1}{4}$ -inch wide flange added to the marking, with no notches in these parts to weaken the metal. The blanks were braked on the inner marking first, the resulting  $1\frac{1}{2}$ -inch flanges braked back (in opposite direction), on the  $\frac{1}{2}$ -inch markings, the first brake remaining at 90 degrees and the second brake closing down to about 178 degrees, just enough opening to admit the metal of the wall.

#### Corner and Door Construction

The radial flanges in the four corners were made by hand, over a piece of so-fashioned 4-inch standard water pipe. (Having access to a brazing outfit in the school, these radial flanges were subsequently brazed to the posts, the additional and not absolutely necessary work rendering the lockers exceptionally strong and rigid. The bottom and the top, holding to the walls by the returned flange, were riveted through the walls, as is the practice in "set-in" ends the country over. In the front of the cabinet reserved for the door and having no wall there were the double-metal flanges of the posts and the double metal of the bottom and the top, the first to hold the hinge and the locking provision, and the latter to form cushions for the door to rest on.

The door itself may be variously fashioned, but in the above instance the simplest construction was adopted, with the two halves necessitated by limited equipment connected together, after all other formation, by riveting through flanges protruding to the inside of the door. Three sides of the door bore a 180-degree doubling of the metal out of which protruded, to the inside of the door,  $\frac{3}{4}$ -inch wide, doubled metal flange on 90 degrees, rendering the door quite rigid. The two right-hand corners were connected by 16 ga. angles, riveted. The left-hand side of the door was provided with a 1-inch wide, double-metal flange, protruding on 90 degrees to the inside of the door. Quarter-inch rod was used, 58 inches long, and wrapped in metal, 4 inches this way, 4 inches that way, producing a rigid hinge riveted to the post-flange and to the 1-inch wide door flange.

Shelves were constructed to fit in between the

(Continued on page 116)



Main entrance and office building. The parapet around the top required intricate fitting of good, old flat copper decking with new Monel gutters and flashing. See sketch and text.

## Reconstruction in Monel

By R. C. Nason

ONE of the most unusual roofing contracts ever handled by Chrystie Cornice & Skylight Works, Inc., New York, is that involving gutters, skylights, siding, flashing and other architectural sheet metal work, in Monel, atop New York's old Aquarium. Though this building is known to millions, possibly it may be news that what now is called The Aquarium was, at time of erection in 1838, New York state's first fort and has 5-ft. stone walls. After the Civil War it became Castle Gardens, popular in the '90's and about 46 years ago, the aquarium.

### Old Roof and New Gutters

Evidently the city fathers were not willing to go to much expense when the Aquarium last was roofed, for the covering throughout was tar composition. The covering did well enough for awhile, but in the past few years leaked badly. Leakage, mixed with tar, dripping into fish pools beneath, resulted in the death of many of the "finny denizens of the deep." Inasmuch as sea air and, during storms, salt water spray and mist, are devastating to ordinary roofing materials the city's park department this time chose Monel metal for the greater part of the current roof improvement. The remainder of new roof covering is a built-up roof, aluminum painted.

The building when first completed was a plain circular structure 200 feet in diameter, but when converted to the aquarium an office, or executive building, was constructed across one side of the periphery. This wing is about 160 feet long, or about three-fourths of the diameter of the older building.

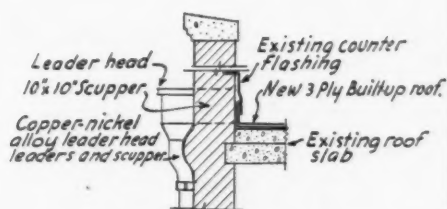
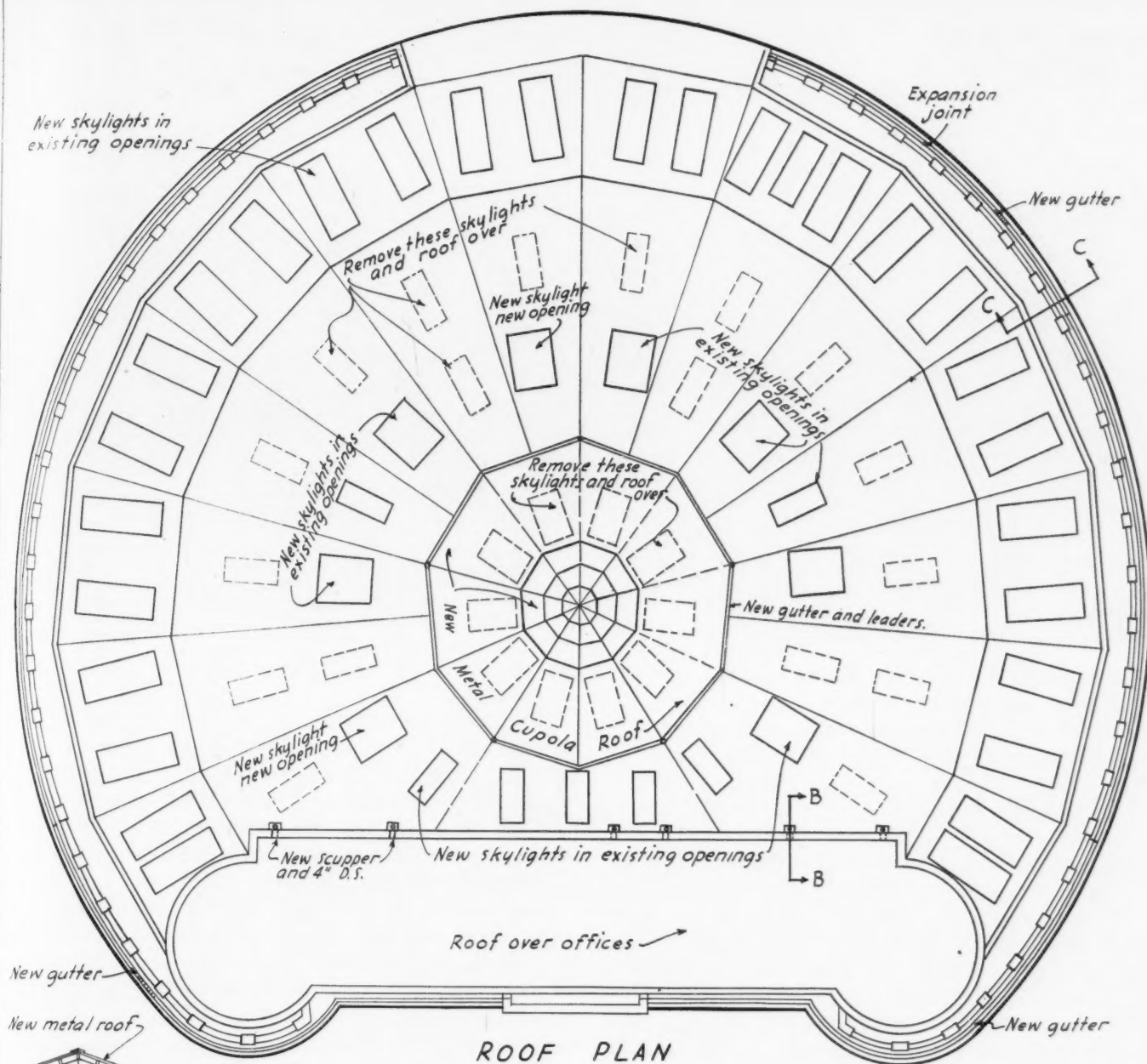
Thus, the new Monel-lined gutter that Chrystie installed around the principle roof diameter, carries well around the office building, though not all the way. The contract completed by Chrystie included a lowest, or outer gutter, 500 feet long. Its depth is 8 inches and its vertical front is ornamental in simple pattern. The back of the gutter connects with a 3-foot walk running between a continuous stone parapet and main roof siding. This application is shown in the drawing and a detail.

### Parapet Now Free to Move

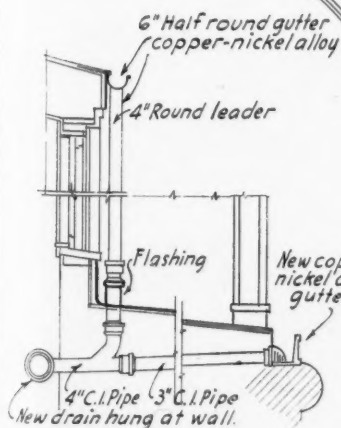
The old parapet flashing of copper, was found to be in good condition and was retained and now forms the cap flashing for the back wall of the Monel gutter. Every 6 ft. along the parapet is a square stone post (see photographs). These posts made it necessary for the sheet metal contractor to do some intricate fitting to bring the gutter into suitable flashing position at these points. As completed, the back slope of the gutter is free to move under the post and walk flashing, although the metal was carefully grouted into posts and attached to roof sheathing by cleats. Expansion joints in the Monel gutter occur, also, every 20 feet, thus enabling metal movement both ways.

Also included in the Chrystie order was the fabrication and installation of six 12 in. x 12 in. Monel gutter boxes and leader heads with lead outlets for the side of the office building that faces the roof (see photograph). These heads are one-half countersunk in the wall and drainage waters falls through a stub elbow onto the Monel wall

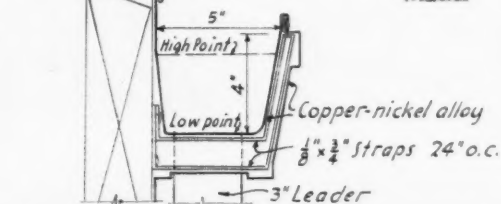
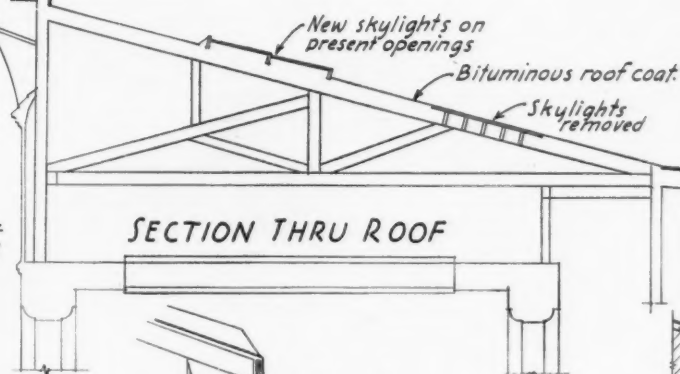




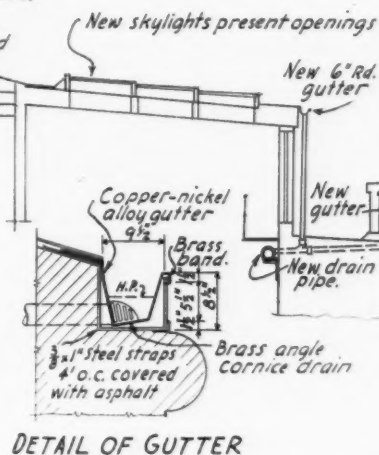
**SECTION B-B**

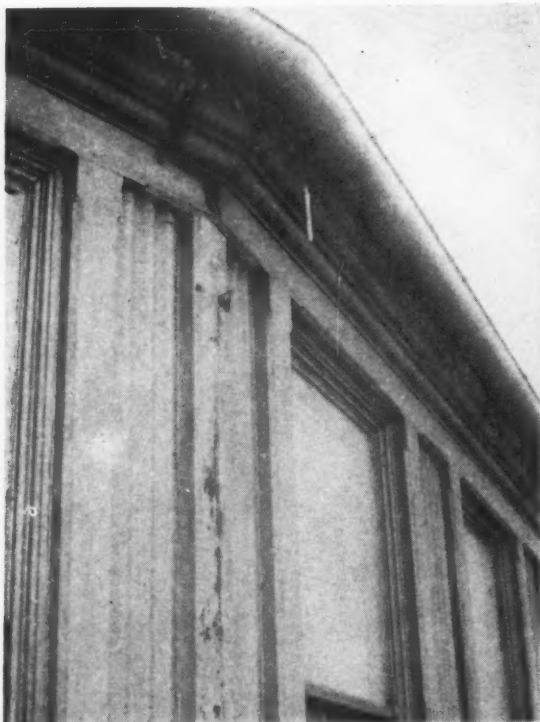


**SECTION C-C**



**DETAIL OF CUPOLA GUTTER**





Above—New, wide Monel roof flashing at base of new rear wall of office building. Note stub drain heads. Flashing is set 6 inches into wall. Left—Old gutter which was replaced; typical tar 'icicles' and 11-foot high steel-covered wall of aquarium monitor which was found in good condition.

flashing of the circular roof below. Though infrequently a part of the sheet metal contract, the new cement wall shown in one of the photographs was planned and built by the Chrystie company. This enabled Chrystie to see to it that the upper flashing edge was well grouted, 6 in. in this case, into the concrete and insures leakless results, sometimes lacking when two different contractors do parts of the same project.

The circular roof above the aquarium proper rests on 11-foot-high siding of lumber that was surfaced with sheet steel. Care in keeping the metal well painted and repaired has resulted in such excellent metal condition that no renovations had to be made in this siding, although it was said to have been laid about 30 years ago.

#### Gutter and Skylight Reconstruction

One defect had to be repaired—the old hanging sheet metal gutter and the old composition roof were in bad condition. The metal had disintegrated and tar from the roof had "run" so badly that "iciclelike" formations between roof and gutter provided "icicles" as long as 18 inches in some cases and 6 inches in others. So Chrystie formed and hung a new 8-inch Monel gutter as a replacement, attaching the gutter to roof sheathing by cleats. Gutter length is in the neighborhood of 450 feet.

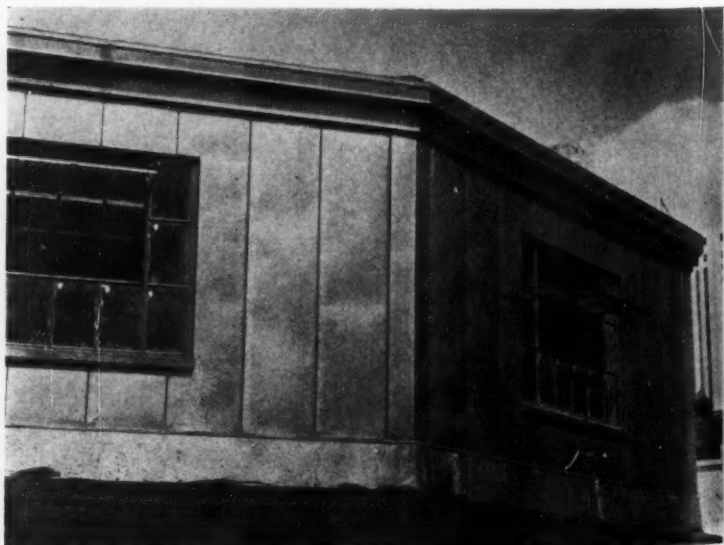
Reconstruction on the main roof centered on 48 large skylights, and the 10-sided tower and the cupola covered with Monel. The tower has a round skylight of heavy corrugated glass.

In the outer row of skylights there are 33 units; in the inward, or upper, row, 15. The general pattern and construction is clearly shown in the photographs. They replaced similarly placed flat lights. One of the first things Chrystie did was to

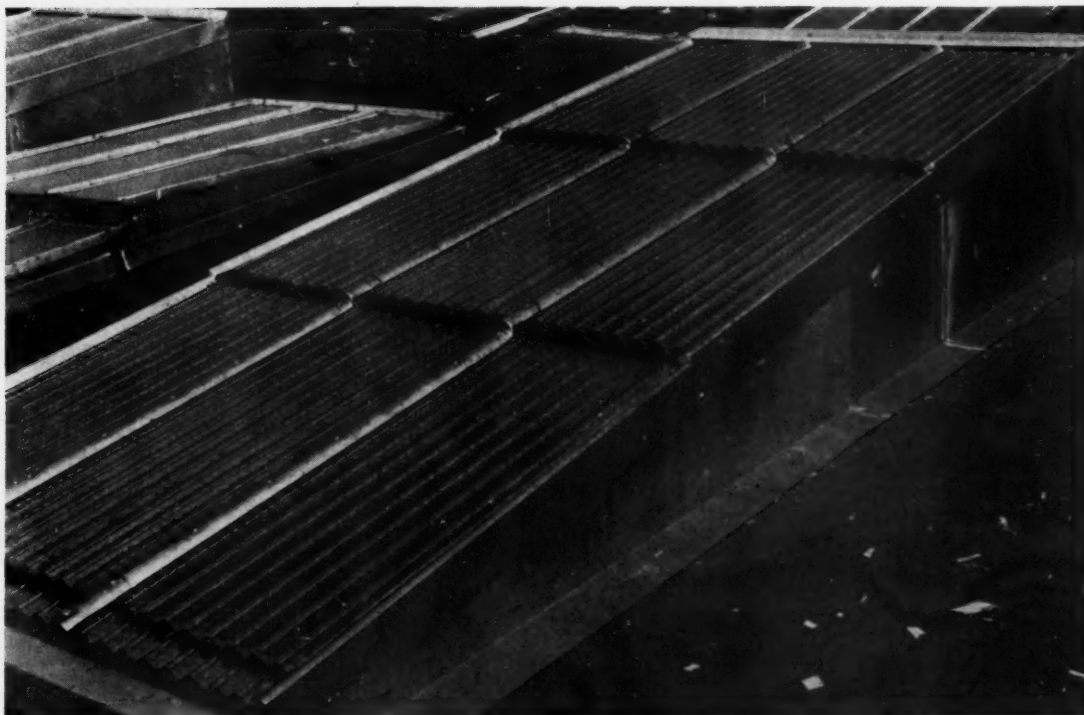
raise decks so that the present pitch is 3 inches per foot.

This meant raising rear decks 17 inches with corresponding elevation of lower and side decking. This reconstruction is indicated on the sketch. Corrugated glass, with Monel capping, was set onto the revised understructure. The larger, or outer, lights are in two equal sections, the upper overlapping the lower section.

Rear sides of the new and larger skylights are 3 feet above the roof. Width is 4 feet 6 inches and length 10 feet. They are spaced on 18 foot centers. One feature of the finished work is the generous flashing, with saddles on the upper ends to divide drainage while the base flashing is convex and slightly flared. The sheet metal work throughout is 18 gauge, thus making unusually strong, tight and rigid work. Some 30 feet up the roof, toward the 10-sided tower, is another row of 15 similar skylights, although shallower as to decks and smaller in area.







New Monel skylights in outer row. Rear is 3 feet above roof. Note wide Monel cheek flashing; Monel bars and edging strips. An old skylight is shown adjacent.

Crowning the roof is the 10-sided tower whose siding is standing seam Monel, with wide roof or base flashing of the same material. Each tower side is 14 feet wide by 8 feet high, seams 21 inches on centers. There is a 4-foot by 5 foot window in each side. Finishing off each side top is a wide moulding and a 6-inch hanging gutter. Drainage is internal. Construction is shown in a detail.

The roof of the tower consists of an outer course of standing seam Monel; above this is a two-section skylight running all around; then a short standing seam Monel course and at the peak, a 10-sided, stamped cap of the same material.

In each typical tower roof segment the standing seams are 21 inches on centers, projection 1 inch, between segments, to make 10 in number,

are heavy hips of 2 inch by 3 inch lumber capped with Monel.

Above the perimeter divisions of the tower roof are 10 heavy corrugated contacting glass skylights, making in reality, a single light, whose caps, bars and trim are Monel, capping bolted to wooden stringers beneath.

The tower cap, also of Monel, is a short section having 10 standing seams, or a single seam each to divide the 10 tower and roofing sections. The metal cap is in one piece. Though skylight bars are polished metal, the remainder of the finish is mill, or "as rolled."

Altogether the Chrystie company fabricated and installed 1,090 feet of gutter as follows: outer, 500 feet, intermediate, 450 feet and tower, 140 feet.



The aquarium monitor (see photo on facing page, also) is re-covered in standing seam Monel, has a new cornice and a standing seam roof. The second roof course is a continuous skylight; the third row is a Monel cap.





The shop-made fluorescent lamps cast a shadow-less light on bench and machine. Scratch marks on metal are quickly visible. The required parts are described in the text.

**T**WO interesting items were recently photographed in the shop of the Goergen-Mackwirth Company in Buffalo, New York.

The first item of interest is the fluorescent lighting fixtures being installed in the shop. These lights are fabricated and assembled by G-M mechanics. One photograph shows five lights above the wall bench. The photograph shows plainly the clear, uniform light on bench and wall and the absence of any shadows cast on work on the bench. Goergen-Mackwirth mechanics are enthusiastic about these lights. They say that scratch marks on galvanized or black iron show so plainly that there is no more hunting for marks.

#### All Parts Made or Bought

The secret of the good light, of course, is the reflector shape and finish. The reflector shape is shown in two photographs and the shape of the equipment box which is placed on top of the reflector is shown in one photograph.

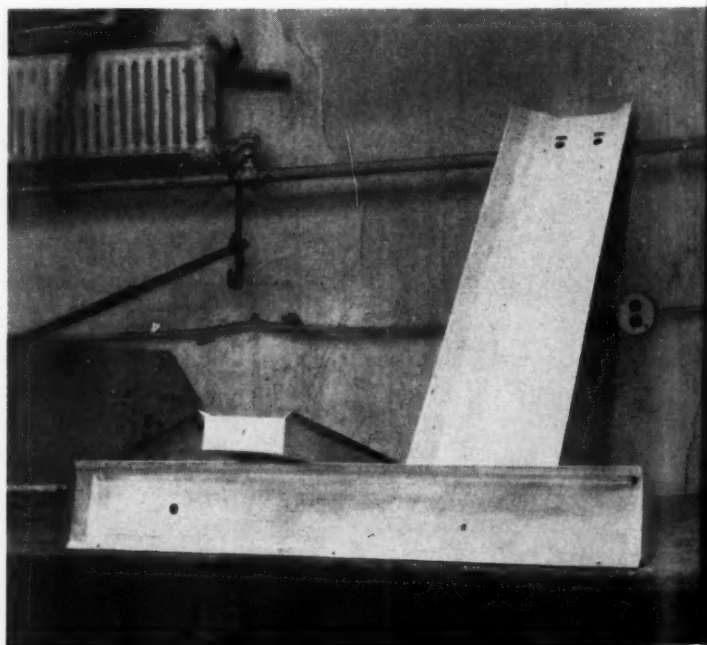
Goergen-Mackwirth eventually will have these lights above all benches and above all machines. The firm is buying parts as follows—two 40 watt, 48-inch fluorescent bulbs for each light; one lamp starting compensator; one lamp ballast; two lamp

## Shop-Made Fluorescent Lights and Motor Cooling Hoods

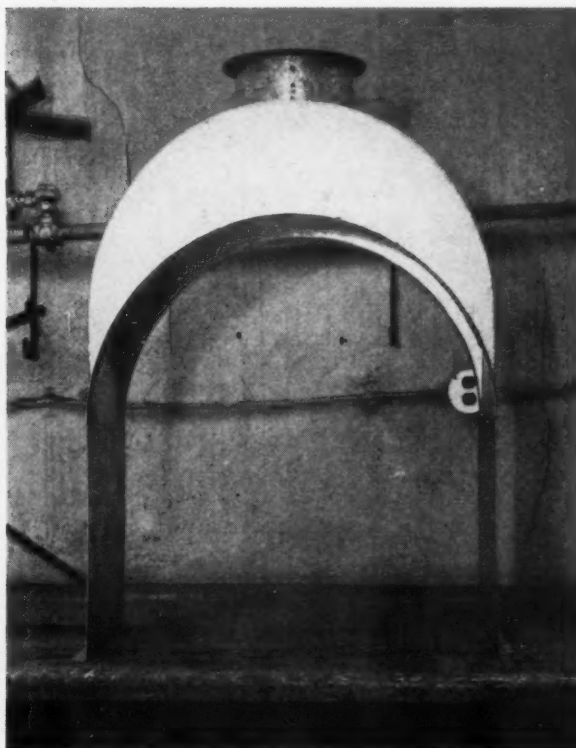
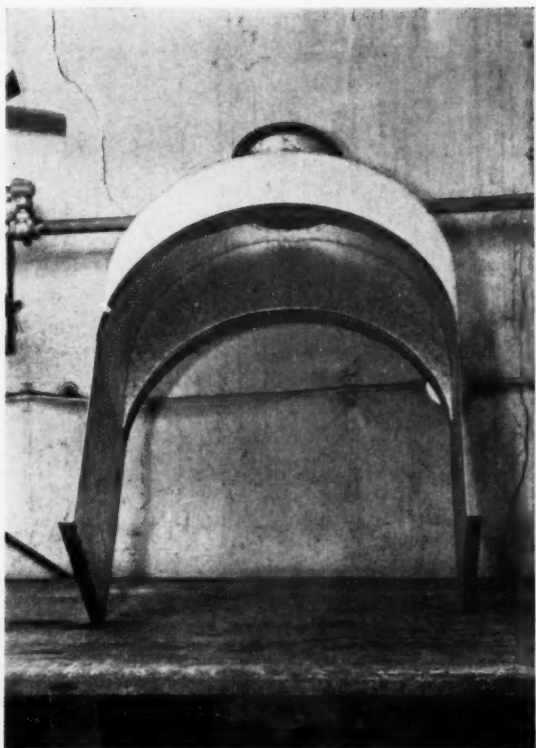
Two readily made items a Buffalo contractor finds useful and salable. The hoods are "stitch" welded to reduce seaming.

starters. All latter equipment is assembled in the box above the reflector. Lamps are wired for connection to 110 volt, 60 cycle A. C. current. Equipment is not obtainable for odd frequencies like 25 cycle.

Goergen-Mackwirth did some experimenting with paints for the reflector and now finish all reflectors with Colorlux (John P. Cochran Co.),



The reflector (leaning against wall) and the "parts" hood are easily made in the shop. All "parts" can be purchased from electrical supply houses.



The motor vent hood straddles one end of the motor and connects with an exhaust fan by ducts. Air must enter the motor at open end and pass through motor to hood. Note hood is spot welded by close stitches to eliminate much seaming.

a quick drying, pure white enamel. This is not a high gloss, but a satin finish which gives the soft, clear light. White DuLux (E. I. du Pont) has also been found satisfactory.

Reflectors and boxes are formed of 26-gauge enameling iron.

#### Ventilating Hoods for Motors

The second interesting item is the ventilating hood for building elevators. A number of these in various sizes have been fabricated by G-M and all have proved satisfactory.

Elevator motors carry a heavy load and if the room in which the motor stands is not amply ventilated the motor overheats. Oftentimes it is not possible to ventilate the whole room suffi-

ciently to cool the motor so Goergen-Mackwirth developed the hood shown. This hood fits snugly around one end of the motor—it does not enclose the motor fully.

The idea is that the hood or hoods are piped to an exhaust fan. The fan pulls air through the hood and, since the hood is reasonably tight, air to reach the hood must enter the unhooded end of the motor, travel through the motor housing and out the hood. The two photographs show the construction. Material is galvanized iron in 24-gauge or heavier, depending on size.

Goergen-Mackwirth believes in welding, so instead of seams or rivets or bolts and screws these hoods are all spot welded with spots close enough together to "stitch" the seam tight.

## Labor Requirements in 1941

**S**IDNEY HILLMAN, Associate Director General, OPM, recently reported that the central task of the Labor Division has been—and remains—the task of providing labor when and where needed in all parts of the country.

The Army and Navy have so far placed contracts for \$2,400,000,000 worth of planes, engines and parts. More than 15,000 planes must be delivered by October 31, 1941, with an even greater number in the next 12 months. In June, 1940, only 117,000 workers were employed by the final assemblers of planes, engines and propellers. On January 1, 1941, the number had risen to 185,000. Today 220,000 are employed. To

deliver the 15,000 planes on schedule we must provide an additional 170,000 workers.

Our ship building schedule calls for 1,120 naval and mercantile vessels. Today governmental and private ship yards employ 251,000 workers. Within the next 18 months we must provide 309,000 more workers to a total of 561,000.

The machine tool industry, often called the bottle neck to armament between 1930-1938 employed only 28,000 workers. In February, 1941, it was employing 85,000 workers. By December, 1941, the industry must have 101,000 more workers—all highly skilled.



Heavy grinding wheels, under heavy pressure, produce large quantities of steel particles and dust. Whereas, formerly, the atmosphere along the grinding row necessitated masks, the collecting system described has completely cleaned the air as this photograph shows.

## Collecting System For Steel Billet Particles

THE Washburn Wire Company, Phillipsdale, R. I., has a billet grinding department in which steel billets are given a preliminary grinding to remove scale and imperfections. As one photograph shows, a number of operators work side by side in the area. Originally no attempt was made to collect the waste from the grinding wheels and the department was not ventilated. The result was dust and steel particle concentration so bad that operators had to wear masks.

The system shown on the sketch, designed by the B. F. Sturtevant Company, Boston, has cleared the air in the department so thoroughly that operators have dispensed with the masks. The important feature of the design is the hood shown in plan and detail to catch the particles and dust right at the wheels, before material gets out into the air.

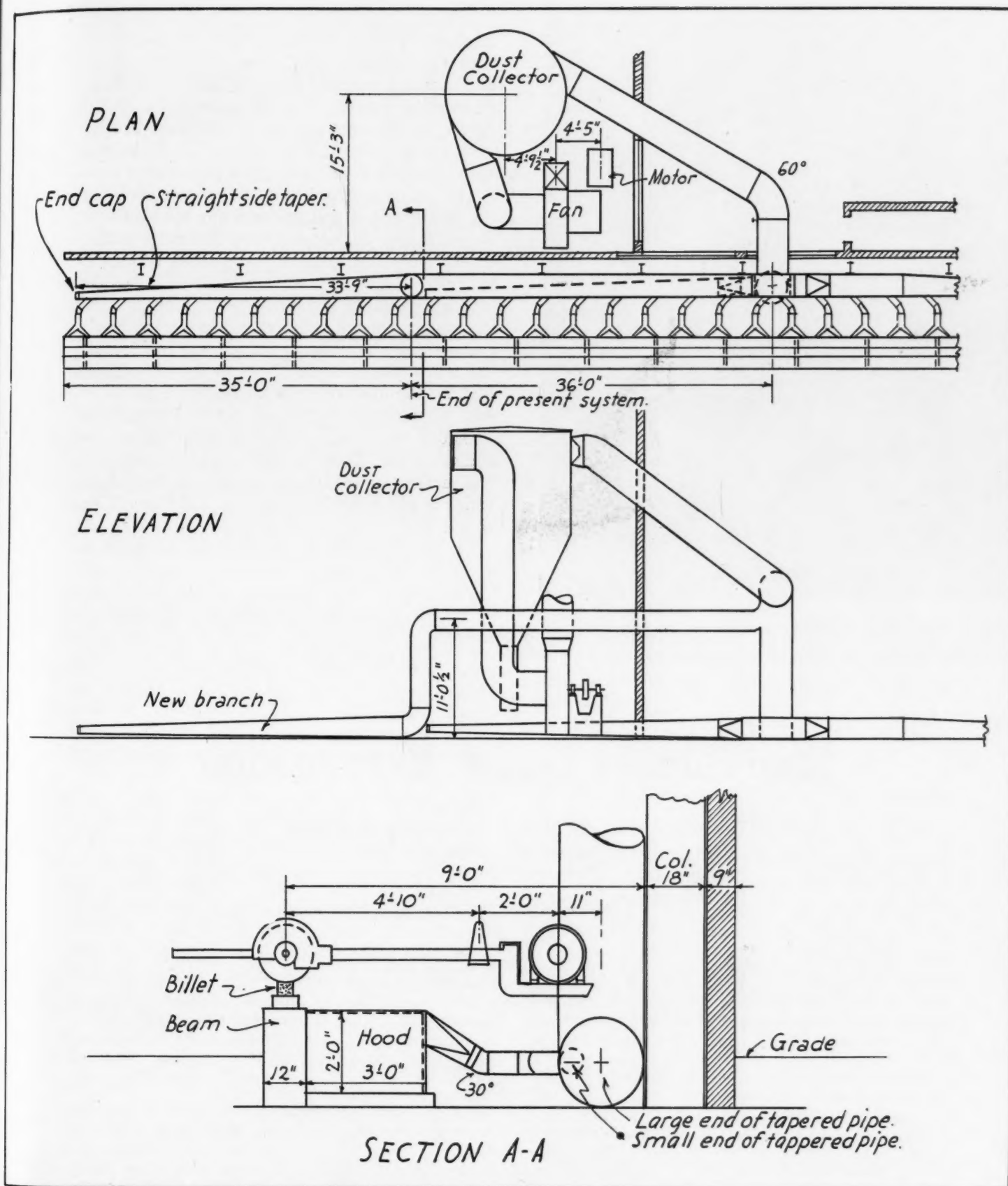
A study of particle sizes and weights, and of the path taken by the directed stream of waste preceded the design of the hood, and resulted in

a very effective hood design. As the photograph and sketches show, a shield integral with the wheel arm deflects the particle stream downward into the hood box. The branch pipe is taken off the upper, rear side and connects to the main exhaust line. This space traversed by the branch is used only as area in which to swing the suspended grinding wheel, motor and arm, so pipes did not have to be depressed or elevated.

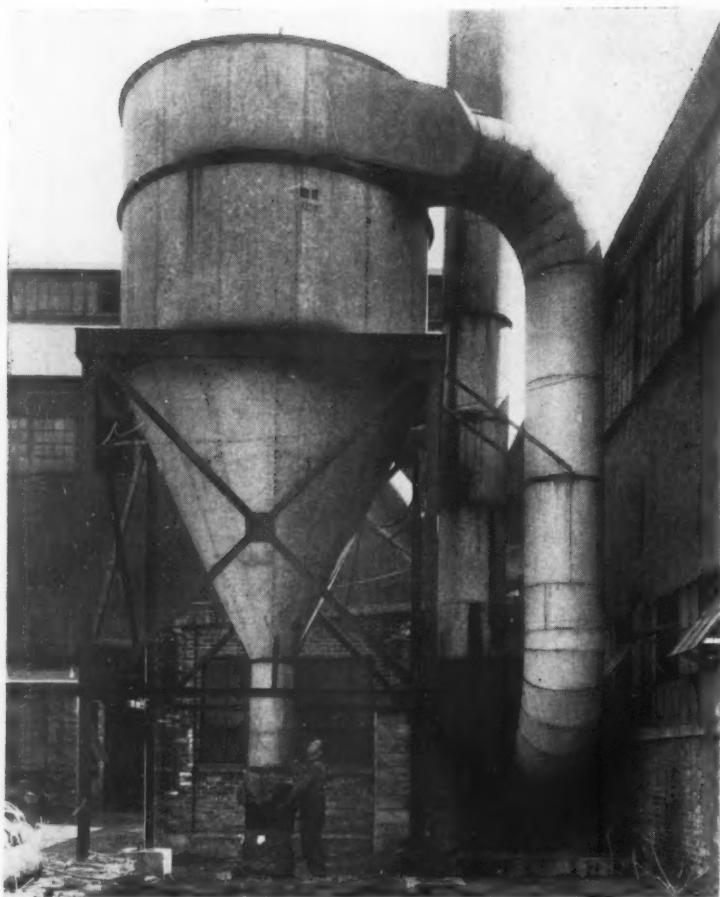
Material ground off the billets has an approximate specific gravity of 5 and averages about 20 microns in size. To handle 30 wheels in a system where the most distant wheel is about 100 feet from the cyclone entrance, 22,500 cfm are moved by the Sturtevant Planovane Exhauster fan against  $4\frac{1}{2}$  inches of static pressure.

The pipe system consists of the three branches shown in the elevation. Two branches of equal capacity split two ways from the riser pipe within the building. The third branch rises at the end of one of the branches mentioned and passes above





Plan, elevation and details of the system. Pipe sizes have been omitted since in systems of this kind the piping has to be "tailor made" for the installation, depending on resistance, distance transported, fittings, etc. Comparison with the photograph facing will clarify the details. For complete understanding of the exhaustor, collector and piping see the photograph on the following page.



The sloping pipe in the background is the line from the grinding wheels. The vertical pipe in the middle is the exhaust from the mill exhauster. Only air discharged.

this branch inside the building to its connection with the common riser (see elevation). Hood branches are without gates to prevent decrease in velocity which would drop particles. Small degree junction pieces from hood branch to main were not possible in this installation because of space restrictions, so 45-degree pieces were used.

The piping system inside and outside the building is all welded and soldered for air tightness. Branches are 22 gauge; main pipes 20 gauge; cyclone entrance and exit fittings and cyclone 11 gauge.

The separation system is "pull through" with the main from the hoods entering the top of the cyclone and the exhaust line to the fan leaving the top of the cyclone. Note in the photograph that the fan discharge stack rises above the building. Cyclone and blower are outside the building. The 11-gauge sheets of the separator are riveted and soldered. This "pull through" arrangement was necessary to avoid abrasion of fan blades which would occur if the grit passed through the wheel.

The vertical pipe sections are not decreased in diameter as is sometimes done to increase the "lifting" power, but the whole system is designed on velocities and suction sufficient to convey the material.

## Zinc Supply Under Examination

The available supply of zinc is governing, to a large extent, the production of galvanized sheets. The Priorities Div., OPM and the zinc producers report the situation, as follows:

**A** NEW examination of the supply situation in zinc is to be undertaken by the Minerals and Metals Group of the Priorities Division, OPM, it was announced April 22 by Director E. R. Stettinius, Jr.

At a meeting between the Group and representatives of the zinc industry, the present supply and demand picture was reviewed, with special emphasis on the continuing demands which may be imposed for national defense purposes.

The possibilities of changes in the present method of control was among matters discussed. Each producer of slab zinc is now required to set aside for the month of May, an amount of zinc equal to 17 per cent of March production. Out of the pool thus created, the Priorities Division can allocate to meet needs.

Among questions to be considered during the investigation are the possibility of increasing the size of the pool, the possibility of a general priorities sys-

tem for zinc supplies, or the possibility of other changes in present controls.

The demand for zinc for all purposes, including defense and civilian, is now running ahead of production. As a result, cuts have had to be made in the quantity of the metal going to non-defense channels. Total production of slab zinc in March from all sources approximated 73,000 tons.

At the record breaking ninth meeting of the Galvanizers Committee in Pittsburgh, May 2, Ernest V. Gent, Secretary of the American Zinc Institute, reported that, on the basis of present operating schedules and requirement estimates, there would be more than sufficient slab zinc available for all defense needs, including aid to Britain, and, that after these demands are met there will remain available for non-defense use an amount of metal representing 75 to 80 per cent of former normal requirements for all purposes.

# Hot Dip Tinning<sup>\*</sup>

## *of Milk Cans and Ice Cream Cans [Part 2]*

By Wallace G. Imhoff  
Wallace G. Imhoff Co.

The tinning of new and old containers is a service many shops are frequently called upon to render. This article and part I, April, explain how manufacturers and tinning specialists clean, tin and handle cans. While the methods described presume a large production, the recommendations apply to work in small volume also.

### Tinning Operations

*Pickling:*—The tinning and retinning operations are divided into two main steps—pickling and tinning. The pickling tanks may be of wood, or of acid-proof brick. Each pickle tank should be large enough to hold about sixteen cans, of the forty quart size. The pickling acid used for this type of work is muriatic acid. One of the reasons for using muriatic acid instead of sulphuric acid is because it gives a higher quality product.

It is better to heat the pickling tanks with enclosed coils as this gives more accurate control of the pickling baths, by eliminating all dilution of the pickling solution with water from condensed steam in the lines. It is impossible to standardize pickling operations with a constantly changing acid strength and volume of pickling solution.

The work is all pickled in wooden crates (to avoid damaging the cans) which are lowered into the pickling tanks. The temperature of the pickling bath should vary from 140° to 160° F. If it is necessary to pickle over 160° F. then there are not enough pickling tanks to meet the required production, and more tanks should be installed. It is not good pickling practice to carry the bath over 160° F. The strength of the acid may vary from 8 to 12 per cent depending upon the rust or the kind of scale to be removed. All the pickling in this department is on high grade first class steel base. The water lines to the pickling tanks should be one inch lines, and steam lines three inches at the main line, and at least 1 to 1¼ inches inside diameter of the steam coils. For a very large production, that is at least 500 to 800 cans a day, the pickling tank should be at least 10 feet long by 3 feet wide, and 3 feet deep, inside measurements. The number of pickling tanks will depend upon the number of tinning stacks, and the production required. Each hot-

dip tinning stack should have at least two pickling tanks and a wash tank. All the tanks should be the standard size of 10 feet by 3 feet by 3 feet to make them interchangeable units. Particular care should be taken to see that all alkali has been removed from the cans when they come to the pickle. In practically all cases, the best method is to take the cans apart, and tin the separate pieces such as hollow bodies in one setup, and then a run of breasts, etc. Production is higher, quality better, and it is easier to make a large run on one item, or part.

The operations in the retinning of 40 quart milk cans are the following—(some tinned with no bottoms in them):

*Tinning:*—After pickling, they are thoroughly washed and passed on into the tinning room. One complete unit in the tinning room consists of a flux tank, a rough tin pot, a soak pot, a finishing tin pot, a drawing pot, a list pot, and an oil quench tank. The articles first go into the flux tank which may be a liquid flux of zinc-ammonium chloride, or as in some cases, simply zinc chloride to which a small amount of white, fine powdered sal-ammoniac has been added. Some companies use a standard commercial tinning flux as purchased in the open market. From the dip in the flux, the articles are passed on to the rough tin pot. There is 6 to 8 inches of a slag sal-ammoniac flux on this rough tin bath to stop any spattering that might occur. The temperature of the rough tin bath is about 560° F. The next step is the rough grease pot which is held at a temperature of 550° F. From here the next step is into the finishing tin bath which is held at a temperature of 480° F. From the finishing tin bath, the next step is into the finishing grease pot which is held at a temperature of 480° F. also. It is then finally listed, (the drip removed) and then put into an oil quench nearby.

When removed from the oil quench, the articles

<sup>\*</sup>Reprinted by permission from *Metal Industry* for December, 1939.



are placed on a short conveyor and passed into the drying, cleaning, and finishing department. This department can be operated by women. The first operation consists in passing the work through a cedar sawdust wet with kerosene oil. This removes the worst of the oil. After being well treated in the cedar sawdust, it is passed on to the whitening compartment where it is shined, and then it is passed to a pine sawdust box where it is treated with very fine soft sawdust, and lastly they are rubbed carefully with very soft rags. By this time, the work now has a beautiful, smooth, bright tin coating finish.

Whole cans are carefully inspected, tested, wrapped in brown wrapping paper and sent to storage. Can parts are carefully shined, inspected and placed on the conveyor where they go to the assembly department to have the bottoms soldered in, the can tested, the surface shined with whitening and gasoline or whitening and alcohol, wrapped, and sent to storage with the others.

#### Defects in Tinning

There are a number of very important features that must be observed to obtain good high quality tinning. One of these is that all operations must be definitely controlled. The tin baths and the grease pots all must have pyrometers on them clearly showing the bath temperatures at all times. One bad overheating of a tin bath, or grease pot will ruin the contents of the pot. Attention is again called to the fact that only the very highest quality greases and tallows can be used; cheap grades only invite costly trouble, sometimes extremely difficult to locate. The new grease must always be added to the clean grease pot, and when grease is needed for the soak pot it should be obtained by dipping out enough from the clean grease pot. The greases must be kept in good condition.

The pyrometers must be carefully checked from time to time to be sure they are registering accurately. The tin is boiled out twice every night on heavy production. The oil quench tank contains about two-thirds water and one-third oil. The oil is a very high grade furnace oil.

Flaking, or spangling, is often caused by the zinc chloride. When this happens, some tin chloride may be used along with the zinc chloride. Tins containing antimony may also cause this trouble of spangling. Glycerin is used as a flux conditioner on the tin pot. It keeps the flux light and foamy, and the proper consistency is when the boiling flux surface has a shiny, glistening surface like that of a soap bubble. A dry, caky flux will cause flux spots, and give a very inferior, poor finish. Light hoops are tinned at 550° F. for the rough tin pot; 540° F. for the soak pot; and 500° F. for the finishing tin and the finishing grease temperatures.

#### Reclaiming Tin

About 70% of the good tin in the by-products can be reclaimed by the proper treatment. The tin dross and all matter containing tin are first taken to the rough tinning department and treated in the dross tin pot. The material is worked over and over until the largest part of the good metallic tin has been gotten back into the bath. The dirt still containing some tin is then taken outside and worked over in a small reclaiming furnace which consists of a pan about 6 inches deep set over a coal fire. The pan is set on a slant toward the front of the furnace, and there is a small tap metal drain pipe welded into the front of the pan. The tin dirt is spread out in the pan over a large surface area; the pan is about 4 feet long by 36 inches wide and 6 inches deep and made out of 1/2 inch steel plate. When the tin ashes are fairly hot, sal-ammoniac is dusted over them and the whole worked carefully with a small hoe. The metal runs down the pan to the front and when enough has accumulated, it is tapped off into pigs. The great care needed here is to keep from burning or oxidizing the tin in the pan. One man generally does this job as it is too costly to keep men learning and burning up tin at 50 to 60 cents a pound. A small bonus on this job pays well.

#### Control of Coating

The weight of the tin coating is controlled in a couple of ways. For example, the thinner the flux, the lighter the tin coating, and the thicker the flux, the heavier the tin coating. Heavy articles start at a bath temperature around 550° F. and finish around 480° F. Light articles start at 480° F. and finish at about 550° F. The length of time in the tin bath, the temperature of the bath, the gage of the steel base, the manipulation by the men on the pots, all directly affect the weight of the tin coating. Overheating of the tin makes a much heavier, dull, brittle coating that will peel and flake off easily. The purer the tin the lower the bath temperature and the lighter the tin coating.

The testing department consists of a number of compartments each 15 by 20 by 30 inches. They are made of steel and the solutions are heated with a 1/2 inch enclosed steam coil.

#### General Information

There are naturally many difficulties that appear in so many operations. Pickling is one of the first places to look for trouble. A good inhibitor should be used to keep from burning, or overpickling the steel. Then there is the condition of the flux on the tin baths, also the condition

*(Continued on page 132)*

## **THREE WAYS TO WORK ON THIS PROBLEM OF STEEL**

**FIRST...** Place your steel requirements clearly and fairly before your regular source. Explain exactly what you need and *when* you need it. Don't try to get a corner on steel.

**SECOND...** Determine the physical property requirements for each job. List possible substitutions that may be used if necessary.

**THIRD...** Fill your immediate requirements with steel from warehouse reserve stocks. To save time send open orders, as needed sizes may be sold while the quotation is being made. You know this method is entirely safe through the Ryerson one-price policy of many years standing. Naturally, some sizes are missing but we can provide prompt shipment on most all steel products from our nearest plant.

When you have a problem of application, substitution, fabrication or procurement phone, wire or write us. We will be glad to work with you. Joseph T. Ryerson & Son, Inc. Steel-Service Plants at: Chicago, Detroit, Milwaukee, St. Louis, Cincinnati, Cleveland, Buffalo, Boston, Philadelphia, Jersey City.

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ings It Goes Into."**



# Michigan's Proposed Licensing Bill

Michigan, as a state, has been seriously considering a bill to license warm air heating contractors. This bill sets up an enforcing board and establishes standards of design and installation. This proposed legislation was discussed at length at the 1941 Michigan convention (April issue). Since several states and numerous local groups are considering some similar action, we publish this bill in full. This draft is only tentative and must be smoothed out and couched in final legal form, but the intent, purpose and scope are clearly indicated. Additional information may be obtained from Detroit association secretary—N. J. Biddle, Ft. Shelby Hotel.

## A BILL

To provide for the creation of a Warm Air Heating & Air Conditioning Administrative Board of the State of Michigan and prescribing its duties and authorities thereof; the adoption and enforcement of standards for the installation of warm air heating and air conditioning equipment; provide for the licensing of firms or corporations engaged in the business of installing warm air heating and air conditioning equipment; provide penalties for the violations of this act; and to repeal all acts or parts of acts in conflict with this act.

### Scope and Definitions

Section 1.—The provisions of this act shall apply to the installation of gravity warm air heating systems, mechanical warm air heating systems, semi-air conditioning systems, winter air conditioning systems, summer air conditioning systems when installed in connection with or attached later to a winter air conditioning system and combinations thereof and the alteration, repair or addition to such systems or the connection of any additional apparatus or equipment to said systems in or in connection with all public or private buildings; provided, however, that this act shall not apply to the installation, alteration or repair of any equipment whose register output exceeds 300,000 British Thermal Units on any one system or to any parts of warm air heating and air conditioning installations which are definitely assigned by statute to other trades.

The term "War Air Heating" shall mean a heating unit with a system of connecting air ducts to supply and distribute heat to any structure.

The term "Gravity Warm Air Heating" shall mean and include the circulation of warm air by gravity only by means of the use of a heating unit and a system of air ducts.

The term "Mechanical Warm Air Heating" shall mean and include the circulation of air by mechanical means in a warm air heating system.

The term "Semi-Air Conditioning" shall mean and include the simultaneous control of temperature, movement and cleanliness of the air.

The term "Winter Air Conditioning" shall mean and include the simultaneous control of temperature, humidity, movement and cleanliness of air during the heating seasons only.

The term "Air Conditioning" shall mean and include the simultaneous control of temperature, humidity, movement and cleanliness of the air.

## Administrative Board

Section 2.—There is hereby created the warm air heating and air conditioning administrative board of the State of Michigan hereinafter known as the "board" which shall consist of the state fire marshal, the head of the department of mechanical engineering of Michigan State College and six other resident members, citizens of the United States, appointed by the governor as follows: one representative of an underwriters inspection bureau operating in the state; one person from each of the hereinafter described districts of the State of Michigan, who is a representative of a recognized person or firm engaged in the business of gravity warm air heating and/or air conditioning. The term of the appointive administrators shall be for a period of three years except that, in the first instance, two administrators shall be appointed for one year; two administrators shall be appointed for two years; and two administrators shall be appointed for the full three years. Any appointed member may, for cause, be removed from office by the governor. The members shall annually elect a chairman. Four members of the board present at any meeting shall constitute a quorum, but any action taken at any meeting shall require the affirmative vote of at least four members. The members of the board shall serve without compensation but shall be entitled to their actual and necessary expenses incurred in performing the duties of their office.

### Districts

Section 3.—For the purposes of this act the State of Michigan shall be divided into five districts; district No. 1 shall embrace the entire northern peninsula of Michigan; district No. 2 shall embrace all that part of the southern peninsula lying north of the line forming the southern boundary of Manistee, Iosco and the four intervening counties; district No. 3 shall embrace all the territory within the state lying south of the southern boundary of district No. 2 and west of the 85th meridian; district No. 4 shall embrace all the territory within the state lying south of the southern boundary of district No. 2 and east of the 85th meridian with the exception of Monroe, Washtenaw, Livingston, Oakland, Macomb and Wayne counties which latter shall constitute district No. 5.

### Duties and Authority of the Board

Section 4.—The board shall hold regular meetings quarterly and may hold special meetings on call of the chairman. The board is hereby authorized and it shall

be their duty to employ an executive secretary, investigators and other necessary personnel; to grant licenses to those applicants who shall show proper qualifications and have paid the prescribed fees; to examine persons who shall apply for inspector certificates of qualification and to grant such certificates to those who have shown the proper qualifications and have paid the prescribed fees; to suspend or revoke any license or certificate for good and sufficient cause as hereinafter provided and to make any necessary investigation in connection therewith; and to adopt and issue the necessary orders and regulations for the enforcement of this act. For the purpose of safeguarding the health, lives and property of persons, the board is hereby empowered and shall adopt and publish minimum standards prescribing such rules and regulations as they may consider necessary for installations or the repair, alteration or extension of existing warm air heating and/or air conditioning systems or the addition or attachment of any apparatus thereto on all work within the scope of this act, but which shall not be in conflict with any statute of this state; and provided, further, that such minimum standards shall only be adopted and issued after not less than a thirty day notice and a public hearing thereon. Changes in said standards may be made after a thirty day notice and a public hearing, if requested. Notice of such proposed changes shall be given and publication of such changes shall be made in such manner as prescribed by the board. All orders, rules and regulations shall be printed and made available for general distribution and shall become effective at such time as may be determined by the board.

#### Standards

Section 5.—All installations or the repair, alteration or extension of existing warm air heating and/or air conditioning systems or the addition or attachment of any apparatus thereto shall be in conformity with approved standards for safety to persons or property, the statutes of this state, orders issued by the board under the authority of this act and all applicable ordinances.

#### License

Section 6.—No person or firm shall engage in the business of installing, maintaining, altering, repairing or extending or installing any additional equipment in connection with any new or existing gravity warm air heating or air conditioning systems as defined in section 1, without first having obtained from the board a license. Each person or firm operating more than one contracting establishment in the State for carrying on the business of warm air heating and/or air conditioning contracting shall be required to secure a license for each such establishment. There shall be three classes of licenses; class I, class II and class III. Class I license shall cover the installation, maintenance, alteration, repair and extension; or the installation of any additional equipment or apparatus in connection with gravity warm air heating systems only. Class II license shall cover the installation, maintenance, alteration, repair and extension; or the installation of any additional equipment or apparatus in connection with any work as defined in section 1 up to a maximum register output of 250,000 British Thermal Units on any one system. Class III license shall cover the installation, maintenance, alteration, repair and extension; or the installation of any additional apparatus or equipment in connection with any work as defined in section 1.

#### License Requirements

Section 7.—Each application for a license must be made in writing upon regular forms provided and shall include a full statement of his or their experience; financial and other references as required by the board and such other pertinent and reasonable requirements and information as said board may demand. Said application must be filled out in detail and sworn to before a state officer authorized to administer oaths, and must be accompanied by the required fee in such amount as is herein specified for the class of license granted or renewed as follows: for class I, twenty-five (\$25.00) dollars; for class II, thirty-five (\$35.00) dollars; and for class III, fifty (\$50.00) dollars. If the principal place of business of the person, firm or corporation making application for a license is within the corporate limits of a city, village or township where inspection is established as hereinafter provided, fifty (50%) percent of the annual license fee of the applicant shall be turned over to the treasurer of that city, village or township to assist in defraying the expense of the inspection department, and the remaining fifty (50%) percent shall be paid into the general fund of the State of Michigan. Each license shall expire on December 31st following the date of its issuance and shall be renewed by the board upon application of the holder of the license and the payment of the required fee at any time within thirty (30) days before the date of such expiration. Licenses not renewed by the 1st day of February next following their expiration shall be deemed to have been cancelled and any licensee whose license has been cancelled shall make application and otherwise comply with the same requirements as in applying for a new license.

#### Issuing of License

Section 8.—Within thirty (30) days from the receipt of an application accompanied by the necessary fees, the board shall issue a license provided that the applicant shows sufficient experience, proper financial ability to satisfactorily perform, and other reasonable requisites as deemed necessary by the board. Every holder of a license shall keep his or their license displayed in a conspicuous place in his or their principal place of business.

#### Revocation and Suspension of Licenses

Section 9.—No license or certificate issued in accordance with the provisions of this act shall be assignable or transferable. Any license may, after a hearing, be suspended for a period of not over thirty days (30) or revoked by the board if the person, firm or corporation holding such license willfully or by reason of incompetence, violates any statute of the State, or any ordinance, rule or regulation of any municipality of the State or any order of the board pertaining to the installation, maintenance, alteration or repair of any warm air heating and/or air conditioning equipment. In the event any license is revoked, the person or firm shall not be eligible to make application for a period of one year from the date of revocation.

#### Local Supervision

Section 10.—Before January 1st, 1942, the legislative body of each city, or village within the State of Michigan having a population of five thousand or over, according to the last federal census, and of each town-



ship or portion thereof adjacent to the limits of any city having a population of thirty thousand or more, according to the last federal census, shall, and the legislative body of any city, village or township having a population of less than five thousand, according to the last federal census, may; by charter, ordinance and/or by action of its duly authorized authorities, prescribe rules and regulations for the purpose of safeguarding the health, lives and property of persons, provided they are not less than the minimum standards prescribed by the administrative board for installations or the repair, alteration or extension of existing warm air heating and/or air conditioning systems or the addition or attachment of any apparatus thereto on all work within the scope of this act, provided further, however, that no jurisdiction shall be granted or assumed by any township under this act over any part of a city or village having a population of five thousand or over, according to the last federal census, and all such cities, villages or townships shall make suitable for and enforce such rules and the duly authorized authorities thereof shall establish a schedule of permit fees to defray the cost of such enforcement. All persons employed as inspectors in such enforcement service must hold inspectors certificates of qualification as provided in section 12.

#### Permits

Section 11.—No installation of warm air heating and/or air conditioning equipment as defined in section 1 shall be undertaken in or in connection with any public or private building nor shall any alteration or addition be made in any such existing equipment, or any equipment or apparatus be attached thereto in any city, village or township within the scope of this act, without paying the permit fee and securing a permit from the proper authorities; provided, however, that no permit shall be required to make minor repairs as classified and published by the board; and further that in the case of emergency repairs, the application must be filed within three days after making such repairs. Application for such permits describing the work to be done shall be made in writing, in such form as may be prescribed by the said proper authorities, by the person or firm contracting to do the work and shall be accompanied by the required fee. When the applicant has satisfactorily complied with these requirements, a permit for such installation shall be issued provided that the said person or firm shall not have pending a non-compliance notice which had been mailed or served not less than ten days previously, and further provided that the issuance of such permit shall not be taken as permission to violate any legal requirement and no deviation shall be made from the work described in the permit, except in the case of repairs to existing equipment, without written approval of the proper authority having jurisdiction.

#### Inspector's Certificate of Qualifications

Section 12.—No persons shall be employed by any municipality of the State of Michigan as an inspector without first having securing from the board an inspectors certificate of qualification. The requirements for obtaining an inspectors certificate of qualification shall be as follows: The applicant shall be a competent mechanic of good moral character, shall be possessed of such executive ability as is requisite for the performance of his duties, shall have a thorough knowledge of the required standards of both materials and

the method used in the installation of warm air heating and air conditioning equipment, shall have had at least five years experience in the installation of warm air heating and/or air conditioning systems, or, in lieu of such five years practical experience, shall be a graduate of some recognized engineering college with at least two years practical experience and shall pass a written examination given by the board. Before an air conditioning inspector's certificate of qualification is issued to any applicant he shall pay to the board a fee of five (\$5.00) dollars. Each inspector's certificate of qualification shall continue in force until suspended or revoked by the board. Any inspectors certificate of qualification may be suspended for a definite length of time or revoked by the board after a hearing if the holder of such certificate fails to properly perform his duties as an inspector in conformity with the rules and regulations of the board.

#### Authority of Inspectors and Investigators

Section 13.—Any board investigator and all inspectors having jurisdiction shall have the right during reasonable hours to enter any public or private building in the discharge of his official duties or for making any inspection or test of installations or repairs as defined in section 1 and is hereby authorized to order the discontinuance of the use of faulty or hazardous equipment; and if the same is not repaired within a reasonable time, the inspector shall have the right to seal the heating unit or any part of said equipment which will render the same inoperative; provided, however, that whenever any city, village or township by charter, ordinance and/or by action of its authorized authorities shall establish an inspection service as provided in section 10 said inspection shall conform to the rules and regulations established by the board and in the event said inspection is not in conformity with the board's rules and regulations and after a proper notice and hearing, the board may revoke the license of any inspector.

#### Inspection and Approval

Section 14.—Whenever a warm air heating or air conditioning installation, repair or alteration, authorized by the issuance of a permit, has been completed, it shall be the duty of the person or firm installing the same to notify the inspector having jurisdiction who shall inspect the work within a reasonable time. If the work conforms to the requirements established under this act, the authorized authorities having jurisdiction shall issue an approval. If the work is found not to conform to the requirements established under this act, the inspector shall send to the person or firm making the installation a written notice stating the defects which have been found to exist. Upon failure of any person or firm to repair the work in conformity with the requirements established under the provisions of the act within ten days of the issuing of said notice, the authorized authorities shall refuse further permits to said party (and shall immediately notify the board.)

#### Continuance of Municipal Licensing Provisions

Section 15.—In every municipality of the State, where, at the time this act goes into effect, it is required by ordinance that persons, firms or corporations engaged in the business of installing warm air heating and/or air conditioning equipment shall be licensed by municipality to so engage or where any

*(Continued on page 118)*



# San Francisco Host to Big Industry Show and Meeting

**M**ANUFACTURERS from 18 states will display their latest products at the Pacific Heating & Air Conditioning Exposition, in the Civic Auditorium, in San Francisco, June 16-20, assuring a thoroughly representative showing of equipment.

All types of heating, ventilating and air conditioning systems will be represented at the Exposition, as climatic conditions in the eleven western states from which attendance will chiefly be drawn include practically all the variations known to the temperate zone. Charles F. Roth, manager, indicates that special emphasis will be placed on systems appropriate to the milder atmosphere of the coastal region, where building activity is approaching a new peak at the present time.

Oil and gas burning furnaces, self-contained units in which air heating surfaces, filters and blowers are combined to form the so-called winter air conditioners; unit air conditioners, room coolers, evaporative cooling systems and window ventilating units are among the equipment to be displayed for domestic applications.

The larger installations required for commercial and institutional establishments involve more elaborate equipment, including many specialties in the way of indicating instruments and automatic controls. Instrumentation has been highly developed in connection with air conditioning practice, and its scope is constantly widening because of the more rigid demands which are constantly being imposed as the possibilities of the art become more generally known.

Especially significant from this point of view are the uses of distant reading and recording instruments as well as remote controls, manually or automatically operated. In many commercial applications zone heating is required, while oversight and regulation from a single control point is highly desirable. Such requirements in industrial set-ups often are rigidly tied in with process needs for heating, cooling, drying, and so on, making the heating and air conditioning problem a definite phase of the plant technique.

The wide variations in demand embraced by heating and air conditioning practice has encouraged the development of a great variety of appliances, as well as complete systems, and likewise has encouraged a large group of manufacturers to confine itself to such specialties as burners, blowers, pumps, valves, piping, heat exchangers, refrigerating systems, convectors, radiators, registers and diffusers.

The Pacific Heating & Air Conditioning Exposition, therefore, serves a special purpose in facilitating rapid and comprehensive surveys of the art by professional men, as well as executives and managers of properties and industrial undertakings. The forthcoming exposition in San Francisco is especially timely in view of the general business stimulation due to national defense activity, and the great number of plant expansions.

Timely also is the summer meeting of the American Society of Heating and Ventilating Engineers, which sponsors the Exposition, as well as that of the Heating, Piping & Air Conditioning Contractors National Association, held at the same time. These meetings will bring together a large group of technical men including noted scientists from the universities, consulting engineers, architects, contractors, industrialists, business executives and others having particular interest in the field. The Exposition will prove especially interesting to mercantile and service firms which meet the public, theatre managers, building managers and owners, as well as home owners who contemplate building or remodeling to recondition their properties.

A selective audience is assured for the Exposition by the policy of admitting visitors only by invitation and registration. This policy has long been followed by the International Exposition Company, under whose management the Exposition is being organized and conducted.

Following are the manufacturers who have reserved exhibit space at time of going to press with this issue ... also their booth numbers:

	Booth		Booth		Booth
Aerofin Corporation		Bell & Gossett Company		Dowagiac Steel Furnace Com-	
Syracuse, N. Y.....	812	Chicago, Illinois .....	516-518	pany, Dowagiac, Mich.....	718
Air-Maze Corporation		Brown Instrument Company		Dunham Company, C. A.	
Cleveland, Ohio .....	811	Philadelphia, Pennsylvania ...	621	Chicago, Illinois .....	722
Alco Valve Company		California Arts & Architecture		Fairbanks, Morse & Company	
St. Louis, Missouri.....	714	Los Angeles, California.....	424	Chicago, Illinois .....	809
Aldrich Company		California Division of Mines		Fraser & Johnston Company	
Wyoming, Illinois .....	403-405	San Francisco, California.....		San Francisco, California ....	A
American Air Filter Co., Inc.		Carrier Corporation		Fraser Furnace Company	
Louisville, Kentucky .....	D	Syracuse, New York .....	815-817	Stockton, California .....	934
American Artisan		Chicago Pump Company		Friez & Sons, Julien P.	
Chicago, Illinois .....	411	Chicago, Illinois .....	532 & 629	Baltimore, Maryland .....	714
American Society of Heating &		Cole-Sullivan Engineering Com-		Fulton-Sylphon Company	
Ventilating Engineers		pany, Minneapolis, Minn.....	816	Knoxville, Tennessee ..	522-524-526
New York, N. Y.....	1	Detroit Lubricator Co.,		General Controls Company	
Anemostat Corporation of Amer-		Detroit, Michigan .....	410	Glendale, California .....	617
ica, New York, N. Y.....	635	Domestic Engineering		General Electric Co., Air Condi-	
Atlas Heating & Ventilating Co.,		Chicago, Illinois .....	609	tioning & Commercial Refrig-	
Ltd., San Francisco, Calif.....	821	Domestic Engineering Catalog		eration Department	
Basford Company, H. R.		Chicago, Illinois .....	609	Bloomfield, New Jersey.....	E & F
San Francisco, California.....	934				

Grinnell Company of the Pacific	
San Francisco, California ....	417
Heating Equipment Company	
San Francisco, California.....	926
Heating, Piping and Air Condi-	
tioning, Chicago, Illinois.....	411
Illinois Engineering Company	
Chicago, Illinois .....	814
Illinois Testing Laboratories,	
Inc., Chicago, Illinois.....	422
Independent Pneumatic Tool	
Company, San Francisco, Cal..	413
Ingersoll Steel & Disc Div.	
Borg-Warner Corporation	
Chicago, Illinois .....	523
Johnson Company, S. T.	
Oakland, California .....	439
Johnson Service Company	
Milwaukee, Wisconsin .....	906
Keeney Publishing Company	
Chicago, Illinois .....	411
McDonnell & Miller	
Chicago, Illinois .....	904
Mercoid Corporation	
Chicago, Illinois .....	915-917
Minneapolis-Honeywell Regulator	
Company, Minneapolis, Minn..	621
Montgomery Bros.	
San Francisco, California ....	824

Nash Engineering Company	
South Norwalk, Connecticut... C	
Owens-Corning Fiberglas Cor-	
poration, Toledo, Ohio.....	810
Pacific Gas and Electric Company	
San Francisco, California..	826-828
Pacific Gas Radiator Company	
Huntington Park, California..	
.....	912-914-916-918
Pacific Scientific Company	
San Francisco, California.....	714
Penn Electric Switch Company	
Goshen, Indiana .....	726
Peterson Company, Neil H.	
San Francisco, California.....	921
Randall Graphite Products Cor-	
poration, Chicago, Illinois....	736
Ray Oil Burner Company	
San Francisco, California.....	710
Reznor Manufacturing Company	
Mercer, Pennsylvania .....	512
Ric-wil Company, The	
Cleveland, Ohio .....	613
Sarco Co., Inc.	
New York, N. Y.....	822
Skuttle Sales Co.,	
Detroit, Michigan .....	515

Spang-Chalfant, Inc.	
Pittsburgh, Pennsylvania ....	511
Torrington Manufacturing Com-	
pany, Torrington, Connecticut.	509
Trade Wind Motorfans, Inc.,	
Los Angeles, California. 412 and	509
Triplex Heating Specialty Co.,	
Inc., Peru, Indiana.....	425
Tuthill Pump Company	
Chicago, Illinois .....	418
Tuttle & Bailey, Inc.,	
New Britain, Connecticut ....	421
United States Register Company	
Battle Creek, Michigan.....	922
Utility Fan Corporation	
Los Angeles, California.....	2
Waterloo Register Company	
Waterloo, Iowa .....	521
Webster & Company, Warren	
Camden, New Jersey.....	510
Webster Electric Company	
Racine, Wisconsin .....	818
Western Blower Company	
Seattle, Washington .....	415
Young Radiator Company	
Racine, Wisconsin .....	517
Zink Company, John	
Tulsa, Oklahoma .....	514

## 100% on Productive Labor as Overhead Expense

By Benjamin F. John, Philadelphia

"SOME may say," as they did at the Wisconsin State Convention, "that its alright to book-keep at 100 per cent on Productive Labor (for Overhead Expense)—but try and get it."

That remark was evidently made by some one who was not thinking straight. Who was only looking at (and seeing) that great big figure 100 and taking it to mean "double something," when in reality and practice it means that if a shop's expenses for a year is \$4,000.00, and its Productive Labor for the same year is \$4,000.00, these are 100 per cent of each other when compared or are equal to each other.

This reminds me of the Congressman who was listening to an Agricultural economist tell how some farmers made a production gain of 100 per cent. "Then," said the Congressman, "with this huge increase of 100 per cent, the Government should be able to reduce the annual allotment."

"Oh, no," replied the economist, "you see the farmer only gained one cow; he only had one cow last year; that's 100 per cent."

The cost of Material and Productive Labor in a certain business during the year was \$6,150.00. The Overhead expense was \$4,000.00 or 65 per cent of Material and Labor. The gross, net, cost charged for the year was \$10,150.00 of which the \$4,000.00 expense was 39 plus. Say 40 per cent of it. If you want to change "per cent's" to "dollars and cents" to recover the expense, AS WE FIND IT, we must charge on each bill:

\$1.00 for each dollar of Productive Labor, or  
\$0.65 for each dollar of Material and Productive  
Labor cost, or \$0.40 for each dollar of Gross  
Net Cost;

and each one of these methods will give the same result or nearly so, in the majority of shops in our trade.

In 1908 or 1909 Overhead on Productive Labor was introduced at the St. Louis Convention. In the average shop the cost was found to be 75 to 80 per cent, as proven by three years previous records in six representative jobbing shops where two each figured by one of the three methods. Afterward some shops adopted Overhead on Productive Labor rather than Overhead on material and productive labor. Still others adopted expense on gross yearly cost and still others expense on yearly total sales. The most complicated plan is a set percentage for profit added to expenses as a percentage which, deducted from 100 per cent, leaves a balance (in per cent) which equals gross cost divided by the found percentage and equals 1 per cent multiplied by 100 which equals sales price. Then there is the management cost divided among departments and added to the department's own cost. There were others. All these methods seek to divide Overhead Cost equitably, most of which the average trade shop can not afford to adopt and in most instances do not need.

(Continued on page 121)



# Association ACTIVITIES

## National

The Mid-Year Convention of the National Warm Air Heating and Air Conditioning Association will be held at the Palmer House, Chicago, June 3 and 4.

At the Tuesday morning session, C. A. Olsen, president of the association and chairman of the session, will talk on "The Warm Air Heating Industry Today." The Frank Bennett Singers of Chicago will entertain with inspirational patriotic songs. Dr. Charles Copeland Smith of New York will speak. Dr. Smith has been successively minister, sociologist, radio commentator and lecturer. He was educated at the University of Manchester, England, and has been a citizen of the United States and resided here since 1919.

At the afternoon session—Harold S. Sharp, Chairman—Professor S. Konzo will present the "Proposed Method for Standardizing and Rating Leaders, Stacks and Fittings for Gravity Warm Air Systems." B. F. McLouth will talk on "What Is Going On in Michigan"; followed by committee reports; Defense Housing in Army Camps; and Information If You Please (open forum). There will be a manufacturer members meeting.

At the Wednesday morning technical session—F. G. Sedgwick, chairman—A. P. Kratz, Research Professor at the University of Illinois, will present a "Proposed Method for Testing and Rating Oil-Burning Furnaces" followed by discussion. Special Research Assistant Professor S. Konzo will talk on the "Performance of High Side Wall Registers as Affected by Air Volumes and Air Temperature," followed by discussion.

The meeting will adjourn at 12 noon and Wednesday afternoon will be devoted to recreational activities—golf, swimming and games of all kinds. Through the courtesy of the Chicago Entertainment Committee, this will be an afternoon for both golfers and non golfers.

George Boeddener, Managing Director.

## Pacific Exposition

A Pacific Heating and Air Conditioning Exposition will be held June 16-20 in the Exposition Auditorium, San Francisco, under the auspices of the American Society of Heating and Ventilating Engineers, with comprehensive displays of new systems and equipment—air filters, draftless diffusers, humidifiers, temperature and humidity controlling devices, air flow regulators, safety valves, flame detectors for furnaces, electric and pneumatic systems for regulating the operation of remotely located machinery from spaces to be conditioned, hot water heating appliances, window ventilators, window coolers, floor heaters, closet and basement heaters, etc., plus oil burners.

Arrangements will be made to place the educational advantages of the exhibition at the disposal of the public during stated hours on several days.

## Milwaukee

The April 7 meeting of the Milwaukee Sheet Metal Contractor's Association was held at the Medford Hotel, called to order by Vice-president Joseph Geier. The entire evening was devoted to educational work—"Overhead for the Sheet Metal Contractor," by W. J. Janssen of Milwaukee.

Milton A. Hansen was welcomed as a member of the association.

Martin Schaar was congratulated upon becoming the

father of a 10-pound boy. Member Schaar passed the cigars and was toasted after the meeting adjourned at 10 p. m.

Paul L. Biersach, Secretary.

## Philadelphia

The 38th anniversary banquet and entertainment of the Philadelphia Roofing, Metal & Heating Engineers, Inc., was held on March 28 on the tenth floor roof garden of the Lorraine Hotel. The dinner was good and spirits were high; there was music and a fine entertainment of five acts.

J. S. Speer, special agent in charge of the Bureau of Investigation in this district, gave a very interesting talk concerning the duty of the FBI and warned the public not to believe all they hear and if they do feel there is grounds for suspicion do not tell it about; tell it to the FBI or the police. Mr. Speer said we are better able to take care of trouble than we ever were before.

Rev. W. Hamilton Aulenbach gave a vigorous talk on the subject "A Quitter Never Wins." He stressed the point that a business man or any individual that will not quit and will cooperate with his fellow business men in a right cause, can not help making a success of himself and his business.

Fred Sulzer, who supplied the entertainment, led the crowd in singing from song sheets and right in the middle of the entertainment Fred introduced one of our own members—George E. Sorenson—as a surprise singer who in a fine tenor voice rendered two lively songs accompanied by the piano.

Walter S. McCallion of Stelwagon Manufacturing Co., was present and convinced over twenty shops how the Ritter system of books could help them—that's real salesmanship.

Commodore Charles Salinger of the Schuylkill Navy told those present that not only was the Navy the best in the United States, but the best in the world, and his boys proved it.

President John A. Naegle kept things going smoothly. Walter M. Kulzer was chairman.

George Oberholtzer was responsible for the display of sheet metal articles, showing the work of the pupils of the Murrel Dobbins trade school, 22nd and Lehigh.

George E. Sorenson, also of the Entertainment Committee, helped a lot in making the affair a success.

Among those present were the following manufacturers and distributors and their representatives:

President Thos. J. Quinn and Mr. Muller of W. F. Potts Son & Co.

Clarence B. Hausman had ticket No. 1.

Archie Williams, sales manager of the Barrett Company.

Alex. H. Haff of the Rubberoid Co.

Robt. McFarland of Carter, Donlevy Co.

Carl Bickell of the Barrett Co.

T. H. Cornell of C. G. Hussey & Co.

A. L. Streeper, of Gracey & Streeper, Glenside, Pa.

Mr. Willette of Hyatt & Co.

D. B. Thompson of Calbar Paint & Varnish Co.

W. J. O'Brien, manager of the Certain-teed Philadelphia branch.

Harry W. Stelwagon, president of Stelwagon Manufacturing Co.

B. F. John, Secretary.



# Association Activities . . .

## New York

At the last meeting of the Board of Directors of the Roofing and Sheet Metal Crafts Institute, Inc., whose offices are located at 60 East 42nd Street, New York City, I. P. Zinbarg, Executive Secretary of the Institute, announced that the bill which had been backed by the Institute had passed both houses of the legislature in New York State and had been approved by the Governor. The Institute is mighty proud of its achievement in New York State and feels that it can go on to bigger things throughout the country.

The bill will eliminate fly-by-nights who carry their offices in their hats. It will no longer be possible for a discharged employee to make any offer to do a job without proper inspection by the authorities. The bill relates to scaffolding, both stationary and moveable. Before any one could do a job upon which scaffolding has been erected, he must first contact the authorities to inspect the scaffolding as to its safety. They must also be able to produce for the authorities evidence that they are complying with the law. This means that if they have workmen that they must show their Workmen's Compensation Insurance Certificate and their other evidences of insurance.

A further result of this bill is that because this is a safety measure, liability insurance rates would be reduced because of the decrease in accidents.

The bill was introduced in the Assembly by Assemblyman Archinal and in the New York State Senate by Senator Halpern. The bill reads as follows:

### AN ACT

To amend the labor law and the penal law, in relation to building construction, demolition and repair work.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

Section 1. Section two hundred and forty of chapter fifty of the laws of nineteen hundred twenty-one, entitled "An act in relation to labor, constituting chapter thirty-one of the consolidated laws," as last amended by chapter six hundred and three of the laws of nineteen hundred thirty, is hereby amended by adding thereto two new subdivisions, to be known as subdivisions five and six, to read as follows:

5. In cities, towns and villages where there is a department, board or officer charged with the enforcement of building laws or ordinances, such department, board or officer shall supervise the erection of all scaffolds on every construction, demolition or repair job. No scaffolding shall be used on any such job until a certificate of inspection and certification shall have been issued for its use.

6. All labor, described in section two hundred and forty above, performed on the exterior walls at a height of over sixteen feet from the ground, except exterior minor repairs or adjustments which do not require continued reaching above or below floor levels or to the outside of and beyond exterior openings, shall be performed upon approved scaffolding erected on the outside of the building.

§ 2. Section twelve hundred and seventy-six of the penal law is hereby amended to read as follows:

§ 1276. Negligently furnishing insecure scaffolding. A person or corporation employing or directing another to do or perform any labor in the erection, demolition, repairing, altering or painting, any house, building or structure within this state, who knowingly or negligently furnishes or erects or causes to be furnished or erected for the performance of such labor, unsafe, unsuitable or improper scaffolding, hoists, stays, ladders or other mechanical contrivances; or who fails to notify the ap-

Explanation—Matter in **bold type** is new; matter in brackets [ ] is old law to be omitted.

propriate department, board or officer in cities, towns and villages where there is a department, board or officer charged with the enforcement of building laws or ordinances, of the proposed erection of a scaffold, or who uses such scaffold in such cities, towns or villages prior to the issuance of a certificate of inspection and certification for its use; or who hinders or obstructs any officer detailed to inspect [the same,] any contrivance enumerated in this section, destroys or defaces any notice posted thereon, or permits the use thereof after the same has been declared unsafe by such officer contrary to the provisions of article ten of the labor law, is guilty of a misdemeanor.

§ 3. This act shall take effect immediately.

Mr. Zinbarg also announced that the Institute is working with the National Board of Fire Underwriters and cooperating with it in the matter of fire prevention. He stated further that a committee from the Institute would wait upon the National Board of Fire Underwriters to attempt to get a reduction in fire rates. It seems that there is a strong possibility for obtaining this.

Mr. Zinbarg also announced that the city and federal authorities have been contacted for the purpose of helping in the defense program towards the fire-proofing of roofs. He stated that many of the authorities had promised their cooperation with the Institute.

The Institute is now considering publishing its own monthly journal and is also considering Group Workmen's Compensation.

The next meeting of the Institute will be held in Brooklyn with Karl Gohlke acting as host to the Institute on behalf of the Brooklyn chapter. That meeting will take place on Wednesday, April 23rd, 1941, which is the regular meeting night of the Institute. Since this is an open meeting, all contractors may attend.

I. P. Zinbarg, Executive Secretary.

## Wisconsin

The Sheet Metal Contractors Association of Wisconsin, Inc., held their Board of Directors and District meeting at the Hotel Retlaw, Fond du Lac, on Saturday, April 19th, called to order by President T. P. Brenner. Over 25 members attended the District meeting, representing quite a number of localities throughout the State.

The Chairmen of the various committees submitted reports of their activities.

Committeeman Fetting analyzed the activities of the Solid Fuel Institute, illustrating with leaflets and folders their methods of attracting the attention of the public to their method of supplying heating equipment, regulators, etc.,—at the same time pointing out the dangerous competition.

D. McLeod, a Fond du Lac attorney, gave an elaborate interpretation of the "Wage and Hour Act" followed by a lengthy question and discussion period.

Racine will harbor the next Board of Directors' and District meeting on May 10th. Madison will take care of the June 7 meeting.

At 6 p. m. the Fond du Lac local spread a wonderful warm luncheon with refreshments.

Paul L. Biersach, Secretary.

## Coming Conventions

May 15-16—Sheet Metal and Roofing Contractors' Association of Pennsylvania. 1941 Convention. Penn Albert Hotel, Greensburg. M. F. Liebermann, 1411 Merchant St., Ambridge, Pa.

June 16-20—Pacific Heating & Air Conditioning Exposition. Exposition Auditorium, San Francisco. Auspices of American Society of Heating and Ventilating Engineers. A. V. Hutchinson, Secy., 51 Madison Ave., New York City.

# Association Activities

(Continued from page 93)

## Wage Rates Labor Situation Popular Heating Systems and Fuels

**B**ELOW is a tabulation made up from a questionnaire sent in April to various associations and individuals throughout the United States. These eight replies give some idea as to wage rates today and the expected increases. There is a shortage of mechanics in most areas.

Apprenticeship courses are offered in schools in most areas and the comments and information is interesting.

Rearmament work affects the West Coast area, the central states, and in the East.

New house construction mostly showed an increase for 1940, with bright prospects for 1941 on the West Coast, and in Philadelphia.

The replies on the percentage of warm air to radiator heating is interesting, as well as the comments on the number of forced air systems, and the fuels popular in some areas.

## Chicago—South Side

The tenth annual banquet of the Master Furnace and Sheet Metal Association of Chicago was held in that city, at the South Side Swedish Club, May 3. It was a highly enjoyable affair, one hundred and seventy members and guests turning out to participate in a fine dinner, followed by entertainment and dancing. The Banquet Committee was composed of Ernie Koerber, Floyd Townsend and Elmer Brodeen. Officers of the association are Harry H. Kay, president; Floyd Townsend, vice president; John Serson, treasurer, and A. L. Nelson, secretary. Master of ceremonies for the banquet was Walter J. Snook.

## Buffalo

At the April meeting of the Buffalo Sheet Metal, Warm Air Heating and Air Conditioning Association members were addressed on the "Yardstick" of the National Warm Air Heating and Air Conditioning Association and were shown a moving picture of the production of copper.

Yardsticks were not available for the meeting, but jobber Frank Minet announced he had a supply and would gladly give one to each contractor asking. The Yardstick was discussed by J. D. Wilder, Editor, American Artisan, Chicago, who briefly outlined the reasons why the Yardstick is necessary; how the Yardstick can be used to best advantage by the ethical contractor; and the reasons behind the principal sections of the book.

The copper movie showed production of sheet and strip copper from the mine to the finished product, emphasizing modern methods of control and finish and showing striking examples of the scores of uses to which copper sheet and strip are now put.

	Oakland, California H. A. Harer, Chairman Furnace Committee, Oakland Furnace Dealers & Sheet Metal Contractors Association.	West Palm Beach, Florida J. T. Stewart, care Boys Roofing & Sheet Metal Works.	Indianapolis, Indiana Jos. C. Joslin, Air Conditioning Council.
1—What was the wage rate for mechanics and apprentices last year; today; and what is the expected rate?	Now: \$10.50 July 1: \$11.00	1940: \$1.50. 1941: \$1.50	1940: \$1.34 1941: \$1.36. Apprentices on a sliding scale.
2—Is there a shortage of mechanics and how does it affect members in your area?	Machines are being installed to make up labor shortage.	Situation clearing up.	Mechanics are in demand. Jobs are plentiful.
3—What apprenticeship courses are being offered in your area today?	California Apprenticeship Council, cooperating with State Department of Education, State Department of Employment, and Training Within Industry Committee.	None at present. Expect some type of school shortly.	Arsenal Technical High Schools of Indianapolis are outstanding in their trade classes, open 24 hours a day with classes all the time. Sheet metal classes include apprentices from both union and open shops. Welding classes are given, both arc and gas welding. Shop classes at Manual Training and Washington High Schools.
4—What is being done in your training course to "Streamline" training of apprentices?		Nothing of this nature exists locally.	Machine operators are needed. All-around mechanics are being developed.
5—Is there a sizable volume of rearmament work contracted for in your area, and what kind of work is your members obtaining?	Oakland Area: \$200,000,000. San Francisco Bay: \$792,185,287. California: \$11,000,000,000.	Only Army air base heating, shower linings, etc., at present.	Defense work going full tilt. About 75% of the new work is on armament work or defense.
6—Have rearmament contracts or sub-contracts stimulated ventilation, blow pipe, or sheet metal work?		Small portion contracted of general sheet metal work. Most mechanics hired direct.	Ventilation, blow pipe work and sheet metal work figure in a big way.
7—Can you give a rough idea of the number of new houses constructed in your area in 1940; in 1941?	11 Western States for 1940: \$374,410,200, or 21.4% over 1939. East Bay gained in home construction for Jan. and Feb. 1941, but March permits were below March, 1940. Northern California: Home building jumped 51.2% in number of new homes over 1940 for the first two months.	Building permits, 1940: West Palm Beach, \$3,111,248; Palm Beach, \$1,552,080.	About 3,100 new homes were constructed in Marion County in 1940. 1941 will run about 2,000.
8—(a) What is the approximate percentage of warm air to radiator heating? (b) What is the percentage of forced air to gravity warm air? (c) How do coal, oil and gas compare in number of warm air installations?	57% low-income houses have gas floor furnaces. 99% homes have gas furnaces. 70% of central furnace systems have forced air.	(a) 50%. (b) 90%. Oil predominates on private installations, coal on Government work.	About 85% warm air, of which 20% are forced air. Of forced air, 60% are coal, 25% oil, and 15% gas.

## Florida

Walter Conlon, director of safety for the Workmen's Compensation Division of the Florida Industrial Commission addressed the annual convention of the Roofing and Sheet Metal Contractors' Association of Florida, as it closed a two-day annual at the Roosevelt Hotel, Jacksonville, April 19. Mr. Conlon's subject was: "Industrial Safety and How It Affects the Rates of the Roofing and Sheet Metal Contractors."

The session opened April 18 with an address by Mayor George C. Blume. The business session consumed the morning and a report was given by L. A. Burgess, of West Palm Beach, secretary-treasurer of the association.

Following the business meeting the delegates wired their representatives in Tallahassee expressing opposition to House Bill No. 60, changing the lien law of the State. They said proposed changes would restrict credit in various phases of the building line. E. Mack Fillingham, president, named a lien law committee: Frank F. Aherns, West Palm Beach; Otto Krauss, St. Petersburg; and E. G. Kohn, Miami.

The Defense program and part played by the roofing and sheet metal industry was the theme of the afternoon session. Speakers were Bennett Chapple, assistant vice president, American Rolling Mill Co., Middletown, Ohio; H. M. Peck, American Brass Co., Atlanta, Ga.; and W. B. Alexander, of the Barrett Company.

A sound picture was presented by the L. J. Mueller Furnace Co.

The annual banquet took place in the evening.

Officers serving at this session were: E. Mack Fillingham, president, Jacksonville; Wm. Palmer, first vice president, Miami; Frank Tack, second vice president, Clearwater.

Committees named were headed by R. E. Morehead, Lake Wales, and C. E. Brown, St. Petersburg, Auditing; John Stewart, West Palm Beach, John Jarets, Sr., Tampa, and Charles H. Stephens, Jacksonville, Nominations and Convention Committee.

## Chicago

At the April 24 meeting of the Furnace & Sheet Metal Institute, the Illinois State licensing law was again discussed at some length. Edwin Fiebrandt, vice president, presided in the absence of President Louis E. Drehtobl.

The Institute annual picnic, after many suggestions, is again scheduled to be held at Long Lake, Illinois, on July 13th.

John Novak, Director.

## Dayton, Ohio

The Sheet Metal Furnace & Roofing Contractors Association, Inc., of Dayton, Ohio, recently elected new officers for the coming year:

George Brake ..... President  
Artie Smith ..... Vice President  
A. J. Hoke ..... Treasurer  
G. H. Heymer ..... Secretary

Dayton right now is a "Boom Town" with every factory working full time in three shifts and many working seven days a week.

Home building is breaking all records and most contractors have more business than they can handle.

With these prosperous conditions and the expectations of higher prices and the usual fall rush—the season has opened much earlier than usual.

George Brake, President.

Capitol District—Albany-Troy, N. Y. James F. Keays, Secy.-Treas.	New York State Sheet Metal, Roofing & Air Conditioning Contractors Assn., Inc. Clarence J. Meyer, Secretary, Buffalo.	Forest Hills, New York Herman Weinberger.	Philadelphia B. F. John	Milwaukee, Wisconsin Sheet Metal Contractors Association, Inc., Paul L. Biersach, Exec. Secy.
Mechanics: \$1.20. Helpers: 55c an hour. Apprentices: 1st yr., 35%; 2nd yr., 45%; 3rd yr., 55%; 4th yr., 70 and 80%. After May 1, 1941: Mechanics \$1.375; helpers, 65c.	Now: \$1.30. May 1: \$1.42½.	\$1.85 per hr. until June 30, 1941.	Advanced from \$1.375 to \$1.75 in union shops; 40 hr. week; time and one-half for overtime. Jobbing shops pay from \$1.00 to \$2.00 depending on the need.	Present rate \$1.30 per hour—a raise of 10 cents per hour.
Furnished mechanics to Government projects in New England and Pine Camp, N. Y.	Shortage of sheet metal and furnace men.	There is a shortage of work for our mechanics.	There is a shortage of mechanics. Many have been employed by shipyards and others engaged in defense work.	Shortage of good mechanics. Some of the men left for camps and shops are up against it to perform effectively.
Shortage of apprentices never felt except when we are very busy. Then the union allows helpers to work in with the mechanics. Troy has a class in their trade school that is very good. Albany has one not quite as efficient.	No apprentice training facilities.	Have successfully operated an apprentice training plan since 1918.	Public school system has allotted space for trade schools and erected splendid shops and class rooms adapted to vocational instruction. Unions frown on apprentices and now allow no helpers.	Milwaukee Vocational School equipped with a fine shop and tools, under the supervision of a committee composed of contractors, labor and state representatives.
Nothing being done to encourage more apprenticeship training.	N. Y. A. Schools opened 3 vocational schools running day and night.	We give a thorough course of training in the shop, on the job and vocational training school. When our apprentices complete their five-year term—during which they are paid good wages—they are skilled craftsmen and competent to start and finish any problem in sheet metal work.	Apprentice training has been modernized to meet changing conditions and needs. Shops with machines are glad to hire them or even allow them to use the machines during training, when there is no interference.	Apprentices trained in every branch of the industry—layout, general sheet metal, heating and air conditioning work and must attend school once a week during school days at the expense of employer.
Rearmament work at General Electric, Schenectady; Am. Locomotive Co., Schenectady; General Electric at Pittsfield, Mass.		There have been some, but for other areas than New York. Most of these are completed.	The only type of work so far has had to do with housing.	Some of our industrialists have received armament work and members of association are doing some work for these industrialists.
About 65 tons of iron ducts to convey hot air to anemostats. No blow pipe work that I know of.	Yes.	To a small extent only.	Large manufacturing plants engaged in defense work are having blow pipe, ventilating, and other sheet metal work done in larger amount. Just how much is hard to ascertain.	Yes, some of these have stimulated ventilation, blow pipe and general sheet metal work.
Most houses built by non-union workers, so we get very little house work.	Dodge Reports show 180% increase in residential building.	Preponderant amount of house construction has been done under non-union conditions, so I am not qualified to answer.	FHA mortgages for March, 1941, increased approximately 23% in both number and amount over March, 1940.	Records disclose that in 1940 total value of construction was \$14,533,687 or 35% increase over 1939. 1941 may equal or exceed 1940.
	80% forced air, gas-fired. 20% forced air, coal-fired.		In 1940, warm air furnaces installed over hot water and steam in the ratio of over 3 to 1, according to the permits issued. Coal is still ahead in gravity; oil holds its own; gas a poor third due to price of manufactured gas. Gravity type is ahead; forced air has increased; air conditioning systems are increasing slowly each year.	Understand that 95% of the installations were warm air—air conditioning.



# New PRODUCTS

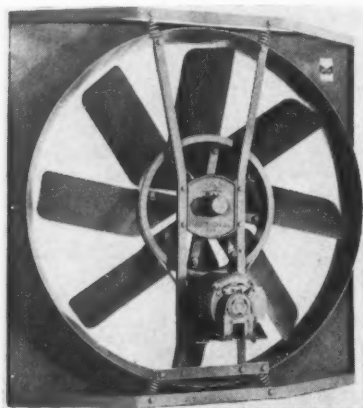
For your convenience a number has been assigned each item. Circle the items in which you are interested on the coupon on page 106 and mail to us.

● Indicates product not listed in 1941 Directory.

△ Indicates manufacturer not listed in 1941 Directory.

## 76—Coolair Attic Fan

American Coolair Corporation, Jacksonville, Florida, announces the Coolair Type 0 home-cooling fan with all moving parts cradled in patented sound-absorbing springs. Welded steel frame is sturdy, compact and relatively light in weight. Eight steel



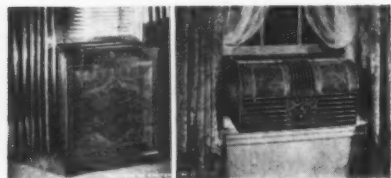
blades, individually mounted for easy replacement, are of new design. Over-size ball bearings in the fan hub require infrequent greasing. When equipped with reversible motor, fan will blow in or exhaust at will.

Capacities range from 6,200 to 30,000 cfm—certified air deliveries, rated by ASHVE test code.

## ●77—Portable Air Conditioners

Philco Corporation, Tioga and C Streets, Philadelphia, announces four new models of portable air conditioning units—three window units and one floor cabinet model.

Model 40 has a cooling capacity of 3,675 Btu, is housed in a walnut wood



cabinet and is recommended for rooms of approximately 11 x 14 feet.

Model 61A has a cooling capacity of 5,750 Btu, filters and circulates fresh air and regulates air flow.

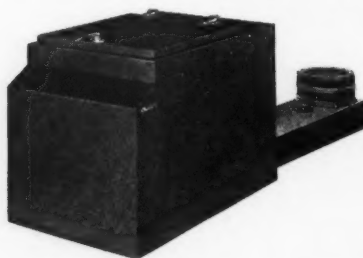
Model 76A will serve rooms as large as 20 x 20 feet, is identical with the 61A model except in size. Btu

rating on this  $\frac{3}{4}$  hp model is 7,500.

Model 91A is housed in an attractive walnut console cabinet, has a cooling capacity of 9,100 Btu and a  $\frac{3}{4}$  hp motor, and is suitable for rooms of approximately 20 to 25 feet.

## ●78—Junior-30 Stoker

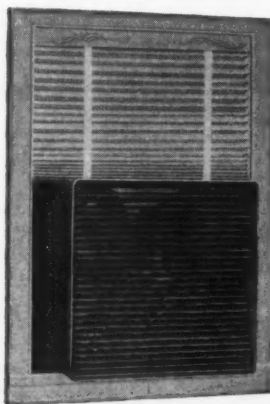
Scott-Newcomb, Inc., 1922 Pine Street, St. Louis, Mo., has brought out a new competitive 30 lb. stoker. This stoker has a hopper capacity of



400 lb., a constant speed transmission, automatic air control,  $\frac{1}{2}$  hp motor with thermal overload switch, shear pin, sectional round retort, heavy cast iron hopper base and many other features.

## ●79—DL 510 Rex-Airate

Air Controls, Inc., Div. of The Cleveland Heater Co., 1933 West 114th St., Cleveland, offers the Rex-Airate window ventilator for small homes, stores and apartments. Model

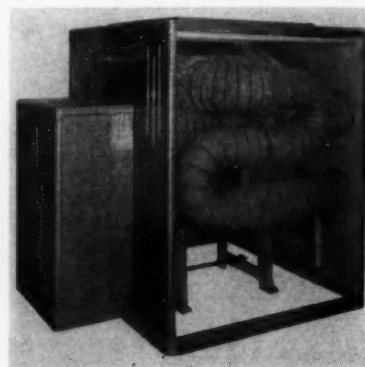


DL 510 produces 5100 cfm and is powered by a  $\frac{1}{6}$  hp motor.

A louver-type grille has blades which can be quickly adjusted to direct the air flow up or down. A reversing switch permits either air intake or exhaust. All-steel cabinet is in walnut finish.

## 80—Oilfired June-Aire

American Foundry & Furnace Co., Bloomington, Illinois, offers the June-Aire B and C series oil-fired air conditioning furnace—a horizontal type unit with snake-type economizers built in on either side. The furnace is designed to burn oil exclusively—



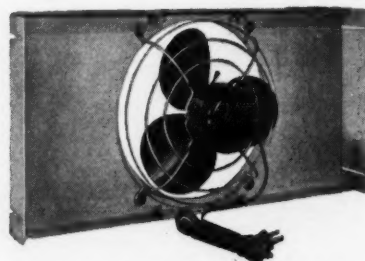
air is heated, filtered, humidified and circulated under automatic control. The Climatemaker oil burner is flange mounted to become an integral part of the heater. The combustion chamber is precast refractory. The unit is built entirely of cast iron. Joints are of the tongue and groove type, gasketed with asbestos packing, filled with furnace cement, drawn and held together with bolts. Cast fins on both the combustion chamber and economizer tubes are swept by the blower-forced air passing over the heater.

Cabinet finish is deep blue color, baked on, with chromium strips.

"Outputs range from 130,000 to 335,000 Btu per hour."

## 81—Window Panel Fan

Wagner Electric Corporation, 6400 Plymouth Ave., St. Louis, has redesigned for 1941 their wall-box ventilator and window panel ventilator.



The panel is adjustable from 23 to 36 inches. Single speed, 10-inch fan delivers 560 cfm. Quiet-type blades, induction type motor.

# New Products . . . . .

For your convenience in obtaining information regarding these items, use coupon on page 106.

## 82—Weld-Master

Ideal Commutator Dresser Co., 1084 Park Ave., Sycamore, Illinois, announces a new A. C. electric arc welder. The design includes a reactance winding on a separate core in addition to the transformer. This re-



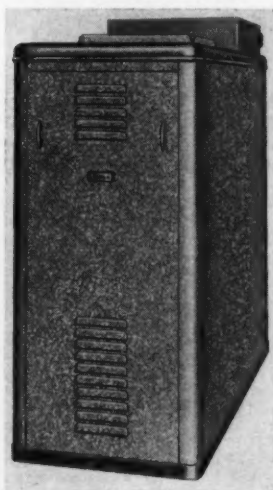
actance winding acts as a stabilizer.

Fifteen different welding heats between 20 and 175 amperes give the operator accurate heat and penetration control.

The standard welder is for 230 volt, 60 cycle operation.

## 83—Luxaire Oil Conditioner

The C. A. Olsen Manufacturing Company, Elyria, Ohio, announces its new line of oil burning air conditioning units which rounds out the line of Luxaire warm air heating and air conditioning equipment.



The heating unit is of all steel, welded construction. A new, non-buckling inner casing which is welded to the outer casing is an innovation. The outer casing of cold rolled steel, with rounded corners is beautifully finished in two-tone green hammerloid enamel, baked finish.

This oil-burning unit is made in five sizes, from 90,000 to 175,000 Btu. at the register.

## 84—Port-O-Vent Unit

Reed Unit-Fans, Inc., 811 St. Charles St., New Orleans, La., offers for 1941 the Port-O-Vent—a Wind-O-Vent on wheels—for the home, office, or industrial controlled air circulation.



The Port-O-Vent consists of a standard Wind-O-Vent set in a substantial steel cradle mounted on rubber tired casters.

A wire guard closes the exposed open side. Venetian blind air diverters put the air where you want it.

## 85—Low-Cost Conditioner

Harvey - Whipple Incorporated, 55 Emery St., Springfield, Mass., announces the Master Kraft Clean-Aire conditioner—Standard Model C-80, with a capacity at the register of 55,000 to 80,000 Btu.



Construction is of heavy gauge copper bearing alloy steel with all surfaces electrically arc welded.

Cabinet is finished in two-tone lacquer with chrome trim, chrome door handles and 2-color name plate.



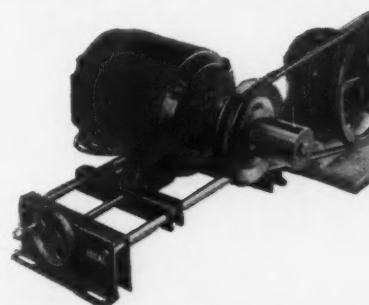
## 86—Airotor Blower Wheels

Torrington Manufacturing Company, 70 Franklin St., Torrington, Connecticut, announces more new sizes of Airotor blower wheels. In the single inlet, single width design 7½ and 10½-inch diameters have been added, and there is a new 12½x10½ inch size in the double inlet, double width design with spider end plates.

Torrington's laboratory is now preparing performance rating charts on "DA" Airotors, which are single wheels riveted in pairs for applications requiring double width, double inlet impellers of sturdy, lightweight construction.

## 87—S-O-S Motor Pulley

The Ideal Commutator Dresser Co., 1084 Park Avenue, Sycamore, Illinois, announces a new variable speed pulley designed for light machinery. The pulley mounts directly on the motor shaft and requires standard V-belts.



Features include short overhang, forced lubrication, balanced sheave and all metal construction. Both halves of sheave move giving accurate belt alignment at all times. The pulley faces are curved so that the belt has full contact at all pitch diameters. Speed ratios up to 2¼ to 1 are available, sizes to ¾ h p.

The complete unit includes the variable pitch pulley and adjustable sliding motor base. By turning the handwheel of the base, the motor moves backward or forward increasing or decreasing belt tension. This causes the pulley to open or close, changing the pitch diameter and the driven speeds. Speed changes are made while the drive is running.

# New Products . . . . .

For your convenience in obtaining information regarding these items, use coupon on page 106.

## 88—Gilco Water Heater

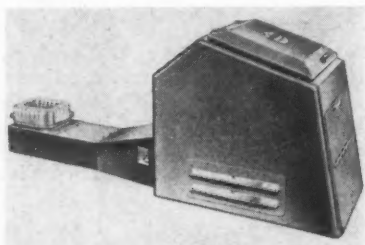
Gerstein & Cooper Company, 1 West Third St., South Boston, Mass., announces the G & C oil burning water heater—using No. 2 fuel oil—and available with or without burner.

Model A heater is equipped with an electric ignition forced draft vaporizing burner and aquastat, in either 25 or 35 gallon storage capacity. Model B is equipped with an insulated precast refractory combustion chamber, ready for pressure gun-type firing—the burner and controls to be furnished—and in storage capacities of 25, 35, 60 and 80 gallons.

## 89—Deluxe Freeman Stoker

Illinois Iron & Bolt Company, 918 S. Michigan Avenue, Chicago, offers the new 1941 Deluxe Model Freeman stoker in three sizes: M-1, with a coal burning capacity of 30 lbs. per hour; M-2, with a coal burning capacity of 35 lbs. per hour; and the M-3 with a capacity of 50 lbs. per hour.

The large capacity hopper—400 lbs.—is built low for easy firing. The hopper is of heavy copper bearing



alloy steel bolted onto a cast iron coal tube and hopper base to withstand the corrosive action of coal.

Deluxe models are equipped with the new Freeman Fire-Stabilizer, which stabilizes the fire and controls the air in ratio to the needs of the fuel bed at all times, maintaining proper fuel bed depth, and banking the fire when the stoker is shut down. They are also equipped with the new special Freeman designed rubber wind box for easy cleaning, repulsion-induction motor and heavy automotive type continuous drive transmission.

Finish is Maroon, trimmed with chromium and bronze.

## 90—M-H Time Controller

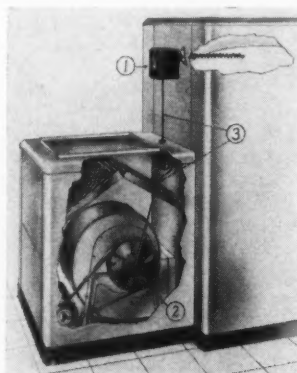
Minneapolis - Honeywell Regulator Company, Minneapolis, has made available a new time controller for automatically controlling the operating period of attic fans, store lighting, refrigerating systems, etc.

The timing mechanism may be set to close a circuit for any period of time from ½ to 11 hours by twisting the knob on the front of the instrument.

The time controller is equipped with a snap action single pole double throw switch. Arranged for flush mounting in a standard two-gang outlet box.

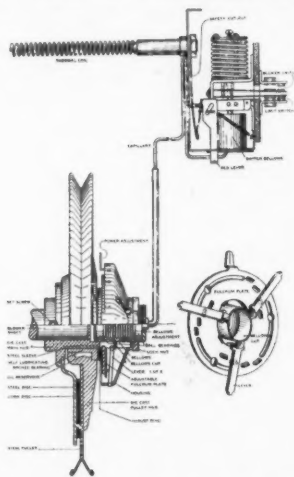
## 91—Blowertrol

White Manufacturing Company, Minneapolis, announces the Master Blowertrol, a group of special instruments which provide dependable regulation of furnace blower speed in di-



rect ratio to the bonnet temperature without a variable speed motor.

The Blowertrol consists of three major units—a combination safety



limit and fan switch; a specially designed fan pulley which provides graduated blower rpm; a capillary tube system connecting pulley bellows with bonnet switch, the system filled with a volatile fluid which vaporizes and actuates the blower pulley to change blower speed.

The bonnet switch is set to open the blower motor circuit at a bonnet temperature of 115 deg. and close the circuit at 110 deg. The high limit switch opens at 175 deg. and closes at 160 deg. A bi-metallic element in the high limit switch acts as a safety cut out at 300 deg. shutting down the

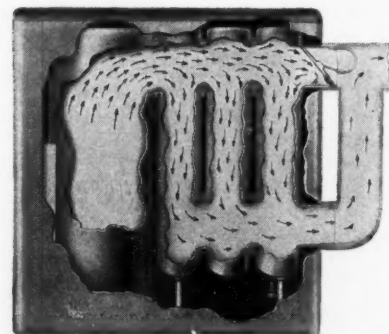
burner. This safety must be manually reset.

When heat in the bonnet vaporizes the fluid in the tube system, the gas produces a pressure which forces the blower pulley against a friction clutch causing the blower to revolve. As pressure increases (under increasing bonnet temperatures) the tighter the pulley and clutch are pressed together the faster the blower revolves to the maximum belted speed.

When bonnet temperature reaches 110 deg. the Blowertrol first starts the blower motor under no load—as bonnet temperature continues to rise Blowertrol starts the blower revolving slowly, gradually increasing speed until full belted speed at 155 deg. bonnet temperature.

## 92—Koolstack

Leader Iron Works, Inc., Decatur, Illinois, announces a complete line of warm air furnaces under the trade name of Koolstack, and utilizing the automatic damper built into an economizer to control stack temperatures by diverting the excessively hot gases through additional heating surfaces of the economizer, to be absorbed by the heating system. (Leader Iron Works was granted a basic patent on this damper some years ago.)



Certain models of Leader Koolstacks are "dressed up" in two-tone baked enamel cabinets, or the same basic unit can be had round-cased for hand firing or replacement jobs, but all are built on the principle of automatic control of stack temperatures and recovery of waste heat.

Combustion chambers are made in two sizes, 24 and 30 inch. To this primary heating surface may be added, one, two, three or more interchangeable economizer sections to secure a unit of any desired capacity.

One basic unit is easily adapted to oil burner, stoker or hand firing.

## 93—Double-Thick Balsam Wool

Wood Conversion Company, Saint Paul, Minnesota, has just announced a new Balsam-Wool of greater thickness and greater moisture protection; available in "Standard" (formerly ½ in.) and "Double Thick" (formerly 1 in.) in widths to fit 16 in. and 24 in. framing members.

The Double Thick blanket has three individual moisture barriers. The Standard blanket has two barriers.



**A 27 YEAR SUCCESS STORY...**

**TYPICAL**  
**JANITROL**  
**DEALER SHOWS THE WAY**  
**TO PROFITS FOR YOU!**

Here is a typical instance of how the Janitrol gas-fired line will work for you: The Huntington Heating and Supply Co., (Huntington, W. Va.) has carried the fast selling Janitrol family for 27 years with consistent profits . . . the 1941 outlook is the brightest in their history. Today thousands of Huntington homes are Janitrol equipped. The profits made with Janitrol in every type of Huntington home are being duplicated in hundreds of communities—you too, can do as well in your local community. There is a complete Janitrol line to meet every requirement of every prospect. If gas is in, or on the way, tie up with Janitrol. It's your best bet! It will pay you to investigate now! Get the interesting facts!

**SURFACE COMBUSTION CORP., TOLEDO, OHIO**



Ever since its creation (1913) the Huntington Heating and Supply Co., showroom illustrated above, has profited handsomely and enjoyed the association with the Janitrol family. One of the popular Janitrol gas-fired Winter Air Conditioning Units is illustrated at the right.



**NOW—**  
**IN BLOCK AFTER**  
**BLOCK OF HUNTINGTON**  
**HOMES EVERY HOME IS**  
**JANITROL HEATED**

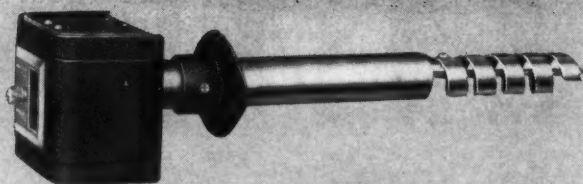


**JANITROL**  
**SC**

**WINTER AIR CONDITIONERS • CONVERSION BURNERS • UNIT HEATERS • GRAVITY FURNACES**

*New Improved*  
**WARM AIR  
 HEATING  
 CONTROLS**

**CA-815 COMBINATION BLOWER  
 AND LIMIT CONTROL**



Located in the plenum chamber or duct of a warm air furnace installation, this control automatically governs the blower to prevent the circulation of cold air and also to stop the burner if plenum temperature exceeds a safe maximum. It is readily adjustable for any control temperatures desired.

The CA-815 is sturdily constructed. The snap-switch assemblies are enclosed in a bakelite case and can be changed in the field with ease. Approximate temperatures are clearly indicated on a dial visible through a window in the cover. This same construction is available in models for straight limit control or for blower control. Also in long or short shank types.

**CA-383 STOKER TIMER**



The No. CA-383 is a "Stand-by" control used to maintain stoker fire by periodic, short interval firing, the length of the firing period being adjustable up to 12 minutes on a 30 minute cycle.

Timers having a 60 minute cycle can be supplied when necessary. Either long or short cycle timers may be readily changed in the field from one cycle to the other. The gear reduction of this instrument is sealed in an oil bath, and consequently never requires additional lubrication or attention. Cam gear turns at but 6 revolutions per hour which eliminates gear wear.

**No. 411 ROOM THERMOSTAT**



The No. 411 is a modernly styled and very sensitive thermostat for the control of heating installations. It is available either with or without compensation (pre-heater). Compensation assures a constant temperature, the elimination of "Cold 70" and the extra cost of overheating.

One unit handles all conditions merely by adjusting the preheater element. This element never has to be exchanged. A separate mounting plate makes installation and wiring extremely simple.

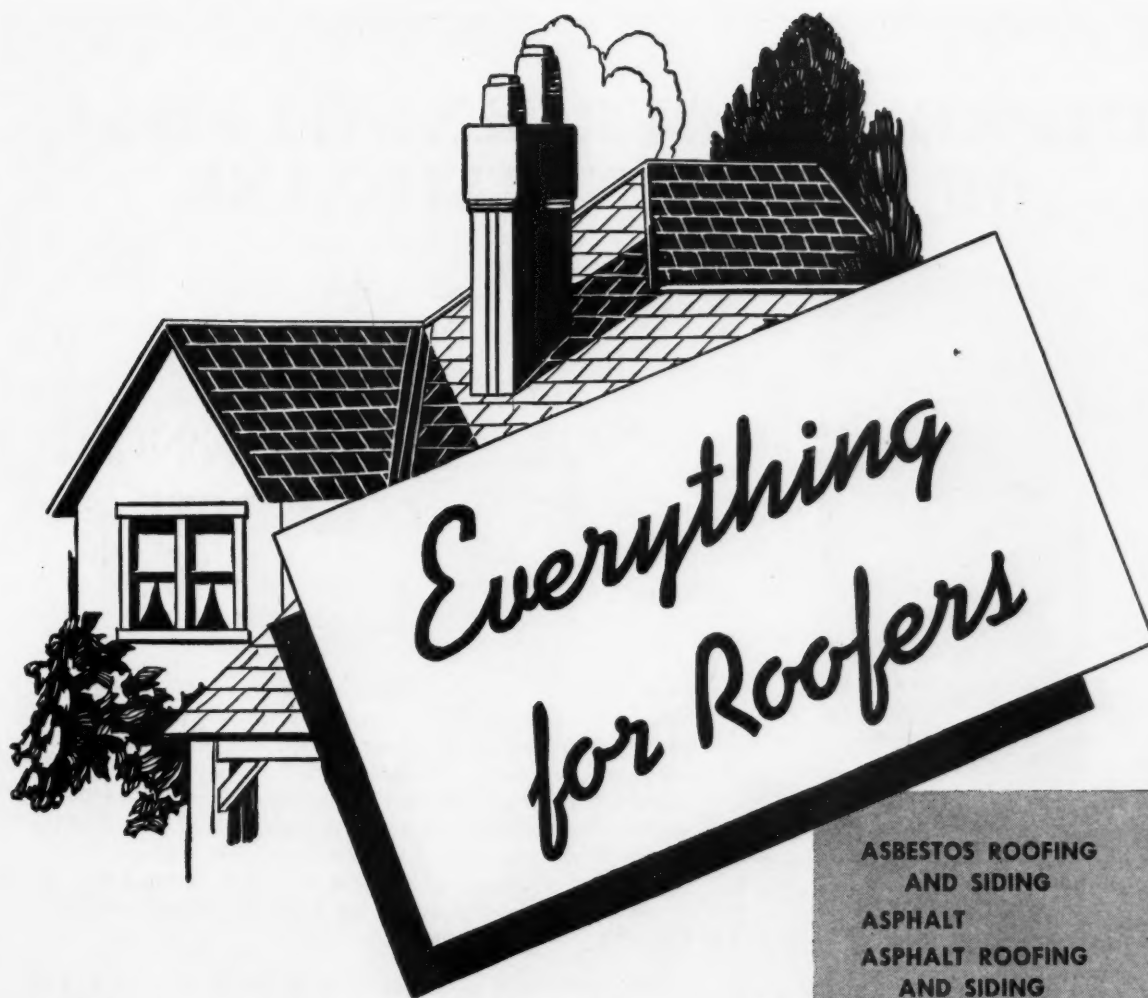


**DETROIT LUBRICATOR COMPANY**

General Offices: DETROIT, MICHIGAN

Canadian Representatives—RAILWAY AND ENGINEERING SPECIALTIES LIMITED, Montreal, Toronto, Winnipeg





Most sheet metal men in the large territory we serve know that they can obtain anything in the line of sheet metal from OSBORN. That is only natural because we've been serving them so long. Not all of them know, however, that this same complete and dependable service is available for all types of roofing.

The wide-spread interest in housing and the low interest rate on money are combining to make this a good roofing year. Whether you confine yourself to repairs, new homes, large commercial work or do all three, you will find that OSBORN carries all of the materials, tools and equipment you use. If you are not already going after some of this business, give it some thought. You will find your OSBORN salesman ready to help you in every way possible.

THE J. M. & L. A.  
**OSBORN Co**  
 CLEVELAND, OHIO  
 BUFFALO • CINCINNATI • DETROIT  
 Distributors of Metals and Metal Products

ASBESTOS ROOFING  
 AND SIDING  
 ASPHALT  
 ASPHALT ROOFING  
 AND SIDING  
 CANVAS  
 CAULKING COMPOUNDS  
 CEMENT, ROOFING  
 COPPER ROOFING  
 FELTS  
 FLASHING  
 GALVANIZED ROOFING  
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 INSULATING PAPER  
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 PAINT OILS  
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 ROLL ROOFING  
 ROOFING CLIPS  
 ALL TYPES OF TOOLS,  
 EQUIPMENT AND  
 SUPPLIES

**A DEPENDABLE SOURCE  
 OF SUPPLY FOR 82 YEARS**



# IMPROVE YOUR KNOWLEDGE OF AIR CONDITIONING



**\$2.00**

SEND TODAY FOR  
The Third Edition  
of Samuel R. Lewis'

## "AIR CONDITIONING FOR COMFORT"

288 Pages—6 1/4" x 9 1/4"—Illustrated—  
Cloth Bound—\$2.00

Here is a book that presents—in simple, readily understandable form—every kind of information necessary for an accurate and thorough knowledge of air conditioning principles, equipment, and practices. Written by S. R. Lewis, a widely-known consulting engineer who has been active in air conditioning work for more than thirty years, it deals with all angles of the air conditioning subject from the practicing engineer's viewpoint. The designing procedures explained in the book are, for example, in every detail the same procedures employed today by the author's own organization.

Featuring this third edition are several entirely new chapters on phases of the subject not previously treated, including noise control, air conditioning measurements, air conditioning standards, fire protection codes and operating suggestions. Brand new designing examples are also used, together with new forms for recording the design data, the proper filling-in of which is explained step-by-step.

The chapter devoted to Psychrometry presents nineteen different formulas for psychrometric calculations. In illustrating the correct use of these formulas, Mr. Lewis applies both the psychrometric tables and chart in order to render both devices thoroughly understandable. The chart used in this edition is less complex than the one used in his previous book.

### OF VALUE BOTH AS A REFERENCE AND TEXT

Engineers in air conditioning will find the new "Air Conditioning for Comfort" invaluable as a reference book, while salesmen, students, and others may rely on it to give them a clear knowledge of fundamentals, and of the latest air conditioning methods and equipment.

Send for a copy today. We know you will consider this volume the most readable and complete book on the air conditioning science you have yet seen. You will risk nothing in ordering a copy, for you will be privileged to return it for a refund if for any reason it should prove unsatisfactory. Use the coupon at the left to order your copy now.

### CONTENTS

- CHAP. 1—Terms Used in Air Conditioning
- CHAP. 2—Heat and Air
- CHAP. 3—Air Conditioning Standards
- CHAP. 4—Air Conditioning and the Human Body
- CHAP. 5—The Psychrometric Table and Chart
- CHAP. 6—Humidity Controllers and Control
- CHAP. 7—Heat Transmission Through Barriers
- CHAP. 8—Ventilation, Solar and Appliance Heat
- CHAP. 9—Heating Systems
- CHAP. 10—Air Conditioning Systems
- CHAP. 11—Air Conditioning Apparatus
- CHAP. 12—Refrigeration and Refrigerants
- CHAP. 13—Refrigeration Compressors and Condensers
- CHAP. 14—Refrigeration Evaporators and Auxiliaries
- CHAP. 15—Record Forms for Heating and Cooling
- CHAP. 16—Air Distribution
- CHAP. 17—Water in Air Conditioning
- CHAP. 18—Noise and Its Control
- CHAP. 19—Air Conditioning Instruments and Measurements
- CHAP. 20—Codes and Operating Suggestions
- 10" x 16" Psychrometric Chart..Inside Back Cover

KEENEY PUBLISHING COMPANY  
6 N. Michigan Ave., Chicago, Ill.

Enclosed is \$2.00 for a copy of the new AIR CONDITIONING FOR COMFORT. If this book should prove unsatisfactory, I will return it within 15 days for a refund.

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STREET .....

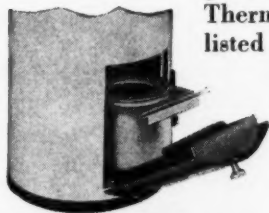
CITY & STATE.....

**KEENEY PUBLISHING COMPANY**  
6 N. Michigan Ave. Chicago, Ill.

## CRASH the NEW HOME MARKET with VIKING!



Models with  
shelf-mounted  
and door-  
mounted burners

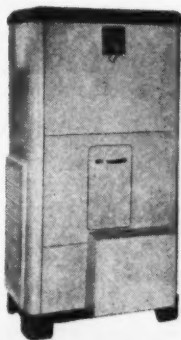


You can march right into the new home market and take full command of water heater sales with the Viking line. It has made spectacular sales records—for installations in single houses and for large housing projects. High quality at a sensationally low price—that's part of the answer! Vikings supply abundant hot water for the average family for a few pennies a day. Completely automatic—always work! Full range of sizes, 20 to 45 gallons, high recovery rates. A-P Thermostat. FUEL OIL BURNER listed as standard by Underwriters' Laboratories, Inc., for FUEL OIL not heavier than No. 2, each unit so labeled. Write for catalog and prices.

### LOW-PRICED, QUALITY Oil Burning FURNACES

Viking Winter Air Conditioners are miles ahead of the field. Specially designed big-value units—55,000 to 100,000 BTU at the bonnet. Easily accessible controls, filters, etc. FUEL OIL BURNER listed as standard by Underwriters' Laboratories, Inc., for FUEL OIL not heavier than No. 2, each unit so labeled. Field engineering service. Write for catalog and prices.

**VIKING MFG. CORPORATION**  
Box 43, Strathmoor Station, Detroit, Mich.



## DO YOU THROW AWAY YOUR SUIT EVERY TIME IT NEEDS CLEANING?

You're mighty extravagant if you do. You can have it cleaned time after time and keep it looking "like new" at very small expense. It's just as senseless to throw away an air filter just because it's dirty and buy a new one to replace it.

### AIR-MAZE FILTER PANELS ARE CLEANABLE— THEY SAVE REPLACEMENT COST

AIR-MAZE filter panels can be cleaned again and again. You can service them yourself at a cost of only a few cents and make them "like new", with all of their original performance characteristics retained.

Because there's nothing to wear out, AIR-MAZE filter panels will last as long as the system in which they are installed. They are sturdy, all metal, easy to clean and 99.3 to 99.83 efficient by actual test. *Approved by the Underwriters Laboratories.*

Change over to permanent AIR-MAZE filter panels and end the expense and nuisance of continual filter replacements. You'll save money and grief.

Write for Catalog GPC-740

**AIR-MAZE CORPORATION**  
5200 Harvard Ave. • Cleveland, Ohio



Lint can be easily brushed  
off the AIR-MAZE Kleenflo  
Filter Panel.



## New Literature . . .

For your convenience in obtaining copies of new Literature use the coupon on page 106.

### 156—Oil-Burning Conditioner Unit

Front Rank Furnace Company, 2500 Ohio Avenue, St. Louis, is distributing a 2-page circular covering their new Front Rank oil-burning air-conditioning unit with capacities of 95,000, 150,000 and 225,000 Btu at the registers.

The cabinet is compact and finished in crackled green baked enamel. The radiator has a triple baffling arrangement. Blower, Dustop fiber glass filters, humidifier as ordered, oil burner with precast combustion chamber, and controls complete the unit.

### 157—Gas Controls Bulletin

General Controls Co., 801 Allen Ave., Glendale, California, has recently issued a 12-page bulletin, supplementing the recently issued complete catalog, and devoted exclusively to gas controls.

The new bulletin includes illustrated descriptions of the Trimtherm, a new room thermostat, the company's full line of automatic gas heating package sets, automatic shut-off valves, solenoid valves, low pressure gas regulators and, in addition, serves to introduce new improvements made on General's B-60 series all-gas-actuated gas valve.

Charts showing sizes, dimensions, pressures, capacities, shipping weights, prices and other technical data cover each item listed.

### 158—Exhaust and Ventilating Fans

The Emerson Electric Manufacturing Company, St. Louis, announces a new catalog titled "Emerson-Electric

Ventilating and Exhaust Fans." This 16-page catalog, X4059, illustrates and describes Emerson-Electric exhaust fans, shutters and protective mesh guards, kitchen ventilating equipment, including the new line of Emerson-Junior kitchen ventilators.

It contains information on ventilation. Where and how to install exhaust and ventilating fans for maximum benefits, how to determine the most effective size of fans to use, and other phases of modern ventilation are discussed. Dimensions, performance, and prices are included for all fans.

### Consumer Literature

**Caloride for Drying Air or Gases.**—The Solvay Sales Corporation, 40 Rector Street, New York City, is distributing an envelope stuffer telling what Caloride is, and where and how it is used to prevent condensation, mold, mildew, rust and other damage caused by excessive humidity. Coupon No. 159.

**Select an Emerson-Electric A. C. Arc Welder.**—The Emerson Electric Mfg. Co., 1824 Washington Ave., St. Louis, is distributing Folder No. X4029 illustrating and describing their four models of A. C. arc welders with maximum capacities of 75, 150, 200 and 300 amperes, with practical suggestions for obtaining maximum results and usage. Prices are included. Coupon No. 160.

**Health Is Cheap—So Much for So Little.**—Two leaflets now available, using the same artwork as appears on billboards and in the national advertising in magazines and telling the story of automatic heating, tie in with the campaign of Minneapolis-Honeywell Regulator Company, Minneapolis. The entire back page has been left open and the dealer's story of his equipment and the services which he renders, as well as the name, address and phone number will be imprinted without charge. Coupon No. 161.

## YOU GET MORE EXTRAS with SKUTTLE



The standard Skuttle Automatic Humidifier Series 300 comes complete with the following equipment, 5 ft. of copper tubing, saddle connector, brass needle valve and brass elbow, sheet metal screws, adjustable rear support, and collar with removable inspection plate. Send your order today.

SEND FOR FREE VAPOGLAS SAMPLE TODAY!

## FEATURES THAT HELP YOU SELL!

1. New adjustable collar for easier installation and insertion of ceramics.
2. Improved rear support for easier adjustment.
3. VAPOGLAS, all glass (unaffected by chemicals or heat) evaporating plates an exclusive Skuttle feature give more evaporating area per square inch.
4. All vitreous enamel evaporating pan built expressly for new VAPOGLAS.
5. Available in four sizes, 18", 20", 24" and 30".
6. Attractively finished in black wrinkle.
7. Tank and valve assembly pure copper and brass.



# SKUTTLE Sales COMPANY

*Air-Conditioning Equipment*

999 FRANKLIN ST.

DETROIT, MICHIGAN



## New Literature . . .

For your convenience in obtaining copies of new Literature use the coupon on page 106.

### 162—Industrial Gas Furnaces

Johnson Gas Appliance Co., Cedar Rapids, Iowa, is distributing a folder illustrating and describing their gas industrial furnaces—heat treating and melting, soldering furnaces, torches and slot-type burners.

### 163—Sheet Metal Machines—Tools—Supplies

Ward Machinery Company, 564 W. Washington Blvd., Chicago, offers Catalog No. 39 covering machines, tools and supplies for fabricating sheet metal—64 pages and cover, indexed. An attached sheet gives price changes effective February 1, 1941.

### 164—Air Conditioning Pipe and Fittings

The Henry Furnace & Foundry Co., 3473 E. 49th St., Cleveland, is distributing Catalog No. 41AC—Moncrief air conditioning pipe and fittings. The cover design shows a duct system outlined on a galvanized sheet background. List prices are included with the illustrations and descriptions of the various items and a dealer discount sheet is attached.

### 165—New Ideal Products

Ideal Commutator Dresser Co., 1270 Park Avenue, Sycamore, Illinois, is distributing a 24-page catalog (their 25th anniversary) indexing their various products on the front page for easy reference. The line includes electric etchers, soldering irons, solderers, commercial vacuum cleaners, grinders, arc welders, variable speed pulleys, and tools.

### 166—Auer Register Book 41

Auer Register Co., 3608 Payne Ave., Cleveland, offers Register Book 41, illustrating and listing all registers and grilles for air conditioning and for gravity heating systems. Several changes and refinements in their line are included, the most prominent of which is the addition of the new Heat-Rite models for warm air purposes.

The Auer line of stamped metal grilles is covered in a separate book, Grille Catalog "G".

### 167—National Advertising Campaign and Dealer Helps

Minneapolis-Honeywell Regulator Company, 2726 Fourth Avenue South, Minneapolis, is supplying a steady stream of materials to enable dealers, jobbers and manufacturers to take full advantage of their national advertising campaign in behalf of the automatic heating industry. A window poster, a posterette, a retail salesman's manual entitled "Contribution to Better Living," reprints of a couple of series of mats for newspaper use, and a sheet showing the spot radio broadcast announcements are among the first releases.

The manual is designed to be used as a part of the salesman's portfolio.

### 168—Draft Control Manual

Field Control Division, Mendota, Illinois, has published a new engineering manual covering the subject of draft controls for distribution to salesmen and individuals called upon either to specify or install heating and conditioning equipment.

In the new manual the Field organization has taken the mystery out of draft control, translating its engineering principles into terms that the layman can understand. The need and function of the draft control in the average heating plant is clearly discussed in this manual. Complete engineering data is included.

Both commercial, industrial and domestic Field Controls are covered. The Field line includes controls from 6 in. up in both standard and motorized models.

DOES YOUR MONEY

TAKE WINGS IN



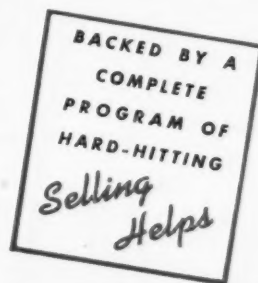
# SERVICE CALLS?



## GRADUATE TO ECON-O-COL WITH NEW EXCLUSIVE *Dynamatic* POWER UNIT!

Why put up with the headaches, the loss of good will, the dissipation of profits in EXTRA servicing costs which are the fruits of selling "cheap" stokers? With money flowing faster now, more than ever before, you can step-up prospects to Econ-O-Col quality—and not only reap, but keep your profits!

Get the complete story today...find out how Econ-O-Col gives you a real "edge" on competition with exclusive, sales-making features. Find out how you can build a lucrative business based on solid satisfaction that will pay dividends for yearsto come. *It's your move!*



WRITE TODAY FOR PRICES AND DETAILS ON  
MONEY-MAKING 1941 ECON-O-COL DEALER FRANCHISE

ECON-O-COL  
Automatic  
COAL BURNER

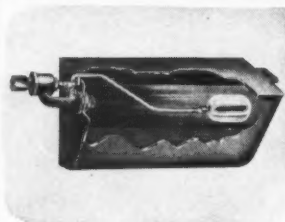
# ECON-O-COL

*The "Stronghearted" Stoker*

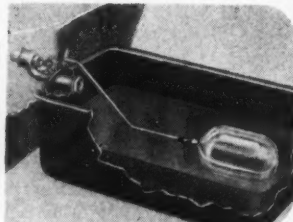
MANUFACTURED BY COTTA TRANSMISSION  
CORPORATION, ROCKFORD, ILLINOIS

THE SHIELD  
OF QUALITY

# M-VB GIVES YOU WHAT YOU WANT IN HUMIDIFIER VALVES



M-VB's #300 Humidifier Valve



This is the M-VB #305

Here's what makes M-VB humidifier valves your first (and best) choice:

**Pyrex Float** Licks corrosion troubles due to mineral content of the water. These pyrex glass floats will stand any reasonable usage. They're checked by the manufacturer—and double-checked by M-VB. Only M-VB offers this important new float.

**Outside valve mechanism** No. 300 and No. 305 have the valve mechanism mounted outside the warm air furnace or air conditioning unit...yet the price is still bed-rock.

**Large valve passageways** Cuts water rush and splashing to an absolute minimum—even under relatively high pressures.

**Fast Installation** Thirty minutes ought to do the trick easily on the average job.

**Long service life** Heavy brass castings—good machining—and M-VB quality in general take care of that.

M-VB design and performance have made M-VB quality an accepted fact. If you manufacture—sell—or install warm air furnaces or air conditioning equipment the humidifier valves you want are the ones made by M-VB. See your manufacturer or M-VB right away.



**M-VB** MORENCY-VAN BUREN DIVISION  
SCOVILL MANUFACTURING CO.  
Sturgis, Michigan<sup>1</sup>  
SCOVILL SAVES YOU TIME IN SELLING—TIME IN INSTALLING

Complete lines of humidifier valves maintained at  
Waterville, Connecticut—San Francisco and Los Angeles, California

## New Literature

For your convenience in obtaining copies of New Literature use the coupon on this page.

### 169—A. C. Registers and Grilles

United States Register Co., Battle Creek, Michigan, offers their new No. 41 A-C air conditioning register and grille catalog—56 pages in heavy red cover. Seven classes in air conditioning registers to suit various needs are shown—Perforated Steel, Non-Directional Flow Styles; Flex-Bar Single Valve Directional-Flow Styles; Vertical Flex-Bar Design, Horizontal Lever-Operated Multiple Valves; Horizontal and Vertical Adjustable-Bar Styles, Single Valve; Vertical Adjustable-Bar Styles Horizontal Lever-Operated Multiple Valves; Close-Space, Fin-Type Style, Single Valve; and Open-Space, Fixed-Bar Style, Single Valve.

Illustrations are supplemented by cross section sketches showing bar arrangements and list prices. Selection Charts showing grille size, static pressure, air throw, drop and approximate floor area of conditioned spaces are included to aid in matching registers to design conditions.

#### FOR YOUR CONVENIENCE

American Artisan, 6 N. Michigan Ave.  
Chicago, Ill.

Please ask the manufacturer to send me more information about the equipment mentioned under the following reference numbers in "New Products" and "New Literature." (Circle numbers in which you are interested):

76	77	78	79	80	81	82
83	84	85	86	87	88	89
90	91	92	93			
156	157	158	159	160	161	162
163	164	165	166	167	168	169

Name .....

Company .....

Address .....

Are you Manufacturer—Jobber—Dealer—

## With the Manufacturers . . .

### Utility Fan Formal Opening

Heating and cooling dealers from many parts of the West, engineers and utility officials attended the opening of the new Utility Fan Corporation plant, 4851 S. Alameda St., Los Angeles, on April 10.

The new factory, which marks the fifth expansion of



the company in ten years, has more than three acres of floor space and represents an investment of approximately one-quarter million dollars.

Products manufactured include gas-fired forced-air furnaces, floor and dual-register furnaces, circulating heaters, evaporative air coolers, blowers and industrial exhausters.

For Alert Dealers -

✓ Bigger Profits  
✓ Faster Sales  
✓ Customer Satisfaction

- AUTOCRAT Oil Heat



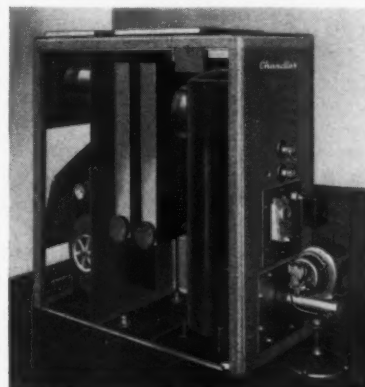
Complete with Autocrat Balanced Flame pressure burner. One-piece chassis. Extra large heating surface. Automatic humidifier. Quiet 4-speed blower. Filters. Preheating Economizer.

IT'S new . . . the Chandler "90" Oil Fired Winter Air Conditioner . . . the high-efficiency, low priced unit you need to boost sales. You can sell the "90" at a surprisingly low price and still make a good profit.

Specially built, engineered and styled for your biggest market—the 5 or 6 room home. 90,000 B.T.U. capacity (at the register) makes the "90" eligible for *three out of four jobs!* Sell it . . . install it and you can guarantee its performance.

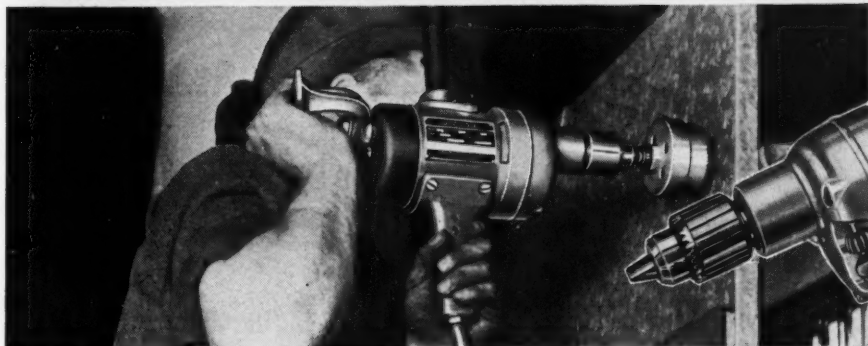
The new Chandler "90" is compact—easy to install—easily serviced. Packed with advanced features that mean better heating, lower fuel costs, longer service and highly pleased customers.

Sell winter health-protection—greater comfort—modern furnace beauty. Cash-in with the money-saving Chandler "90". Write or wire today for Free Catalog A.



**CHANDLER COMPANY CEDAR RAPIDS, IOWA**

**3/4" TO 3 1/2" HOLES IN SHEET MATERIALS  
WITH STANLEY DRILL & HOLE SAWS**



With this Stanley No. 124 Electric Drill and a set of Stanley Hole Saws, you can cut clean, round holes from 3/4" to 3 1/2" quickly and easily in any sheet material. Ask your dealer to demonstrate, or write today for free literature. Stanley Electric Tool Division, The Stanley Works, 131 Elm Street, New Britain, Conn.



**STANLEY #124  
ELECTRIC DRILL**

A Compact, Rugged, Low-Priced Drill of 1/2" capacity. Useful for dozens of everyday jobs in your shop.

**STANLEY HOLE SAWS**

Cut clean holes in any material. High-speed alloy-steel blades. Malleable iron, true-milled holders. Improved locking device for firm anchor.



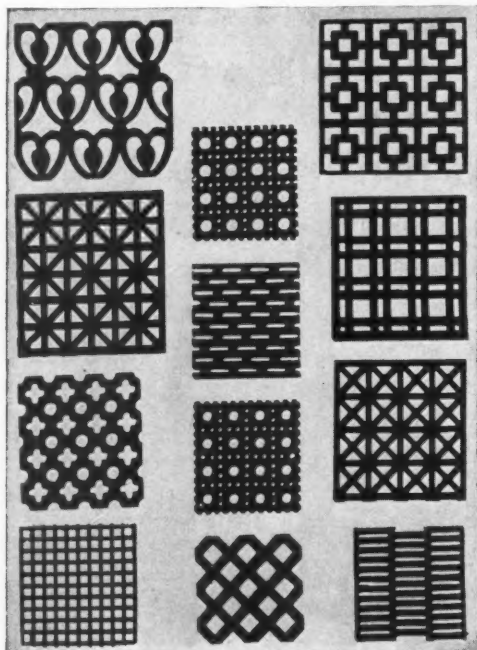
**STANLEY ELECTRIC TOOLS**

"COST LESS PER YEAR"

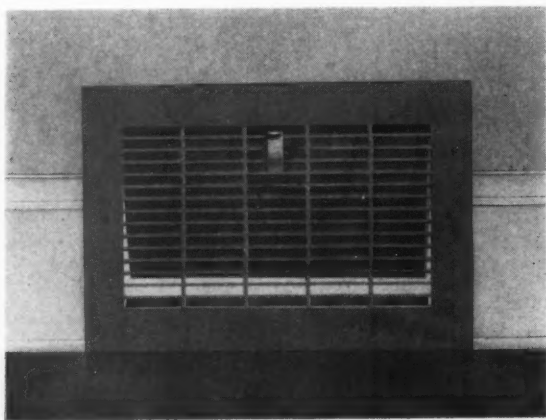




## PERFORATED METALS AND INDUSTRIAL SCREENS IN STOCK FOR PROMPT DELIVERIES



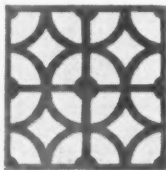
Fancy panels constructed for easy bending. These panels are especially adapted for use as stove casings and similar applications, made to your order.



The low cost register and grilles are of modern stamped design and perform ideally on warm air heating and air conditioning installations. Made in all standard sizes with large open area and with a sponge rubber attachment to prevent dust streaks.



Stamped Ornamental Grilles for Heating and Ventilating Installations.



**Write Today for Our Catalog**

**STANDARD STAMPING & PERFORATING CO.**  
3137 W. 49th Pl. Chicago, Ill.

## With the Manufacturers . . .

### Richardson & Boynton Retires From Business

The century old Richardson & Boynton Co., manufacturers of furnaces and boilers have retired from business. Their patterns have been purchased by Manufacturers Successors Inc. who will continue to furnish repair parts to their duly authorized agents.

Manufacturers Successors Inc. is a new corporation chartered by the State of New York and composed of several nationally known supply companies.

The new corporation has elected the following officers:

President—William L. Healy  
Waverly Heating Supply Co., Boston  
1st Vice President—John H. Oswald  
H. C. Oswald Supply Co., Inc., New York City  
2nd Vice President—James C. Kaufman  
Associated Heater Parts Corp., Chicago  
Treasurer—Edwin H. Krekel  
Stove Manufacturers Corp., Newark  
Secretary—Joseph D. McLaughlin  
Heater Repair & Supply Co., Providence  
General Manager—Bryan VanCleave  
Counsel—Wm. F. Ashley, Jr., 150 Broadway, New York, N. Y.

Richardson & Boynton Company's warehouses will be closed and the stocks will be taken over by the above companies.

### R. W. Menk Is Recovering Health

Rudy W. Menk of Joliet Heating Corporation, Joliet, Illinois, was taken ill the second week of January this year and underwent a painful and delicate operation of the right knee. He is assured by his doctors that his leg will be perfect, but that it will take about a year to rehabilitate the leg.

Mr. Menk is now spending a few hours each day at his office and hopes to be able to attend the June meeting of the National Warm Air Association in Chicago.



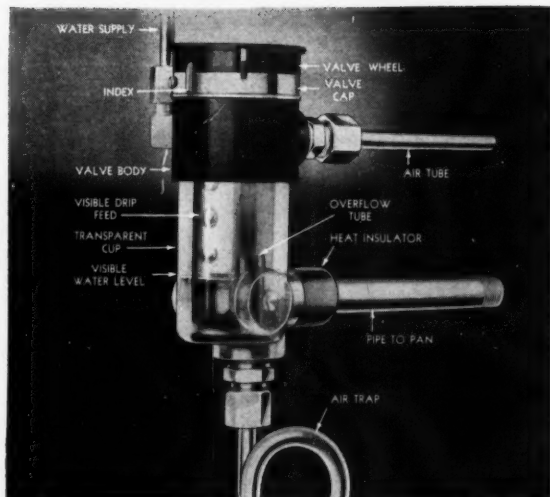
Exhibit of the Hall-Neal Furnace Co., at the Indianapolis (Indiana) Home Complete Show—April 18-27, 1941.

### Nemec Opens Own Business

Al A. Nemec, formerly manager of Capitol Furnace & Stove Repair Co., announces the formation of his own business—the A. A. Nemec Heating Supply Company—at 427-433 Madison Avenue, Indianapolis, Indiana, where he will distribute all kinds of heating and air conditioning equipment, and carry repairs to fit all makes of furnaces and boilers.

Mr. Nemec has had a quarter of a century in the industry and offers his knowledge and experience in answering questions and solving problems. At the present time Mr. Nemec is distributor for Lamneck gravity and forced air fittings and registers, Standard and Roto-Grate stokers, Grant Wilson asbestos products, furnaces and boilers, a complete line of sundry items, and repair parts made of Strokel iron.

A formal opening and big reception party will be announced later.



## New Microfeed Control

Extremely Simple Structure  
Cannot Get Out of Order  
Substantially Trouble-Free  
Non-Corroding—Non-Liming  
Visible Feed and Water Level  
Weather-graduated Control  
Most Modern Design and Materials  
Most Attractive Appearance

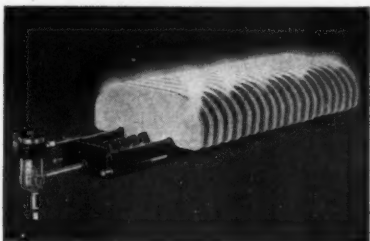
• Comes with vitreous enameled pan to which genuine Monite Plates can be added to attain any desired evaporating capacity. Monmouth Capacity Indicator tells at a glance how many plates any job needs. No guess work.

*The Price Will Interest You  
Be Sure To Get All the Facts*

### MONMOUTH PRODUCTS CO.

1933 E. 61st St.

Cleveland, Ohio



# MONMOUTH

*The Greatest Name in Humidification*

AMERICAN ARTISAN, MAY, 1941



## Modern Heating Units for Every Purpose

*Maximum Heat—  
Minimum Floor Space*

Heating or Air Conditioning Equipment for large or small Dwellings, Buildings or Industrial Buildings, Churches, Schools, Auditoriums, etc.

Our Engineers are at your service.



### "UB" Series Custom-Aire

FOR SMALL FLOOR SPACE . . . The Custom-Aire UB series gas furnace is a completely automatic winter air conditioning unit that, to save floor space, can be installed snugly in a corner or closet. Controls, blower, vent and filters are located in the base and front of the unit where they are readily accessible for servicing. The filter compartment and return air connection shown on the right side is interchangeable and can also be installed on the left side. A special bottom air intake filter compartment is available where it is desired to bring the return air supply directly through the floor under the bottom of the furnace. UB units are available in ten sizes, ranging from 70,000 to 600,000 B. T. U. input per hour.



### "RB" Series Custom-Aire

FOR LOW CEILINGS . . . The RB series Custom-Aire is exactly like the UB series except that the blower and filters are placed to the right of the heating unit instead of beneath it. This compact unit will fit beneath stairs, in shallow basements, or wherever ceilings are unusually low. RB units are available in five different sizes, ranging from 70,000 to 200,000 B. T. U. input per hour.

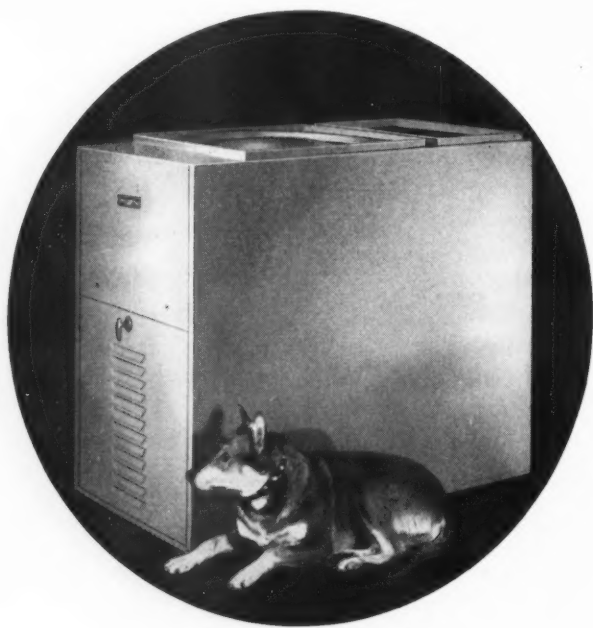
*Write us today regarding territory available and other information.*



## HEATING EQUIPMENT CO.

1123 HARRISON ST.  
San Francisco, California

INTERNATIONAL PRESENTS



## The OIL ECONOMY "85"

Oil Economy 85 . . . the unit designed for the new type of smaller home—26" wide—51" long—40" high—the green enameled jacket encloses burner—Shipped complete—all controls—no extras to buy . . . really a heating and winter air conditioning **Unit**—Metal combustion chamber—Draft regulator—separate oil filter—humidifier and most important of all—Pressure type Oil Burner of modern design and proven satisfaction.

Write to Dept. A-5 for catalog of Oil Economy 85 and other International Products.

# INTERNATIONAL

HEATER COMPANY

WESTERN OFFICE AND WAREHOUSE • 1933 WENTWORTH AVE., CHICAGO, ILL.  
NEW ENGLAND OFFICE AND WAREHOUSE • 110 CHESTNUT ST., NASHUA, N. H.  
STOCKS CARRIED WITH WHOLESALE IN ALL PRINCIPAL CITIES

## With the Manufacturers . . .

### Reining Adds Viking Fans and Blowers

Lou Reining, handling Thermo-Drip humidifiers and Cook heat controls, is now distributing the Viking line of blowers and attic fans made by Viking Air Conditioning Corp., Cleveland.

Mr. Reining will continue to maintain his present downtown Chicago headquarters at 549 W. Randolph Street.

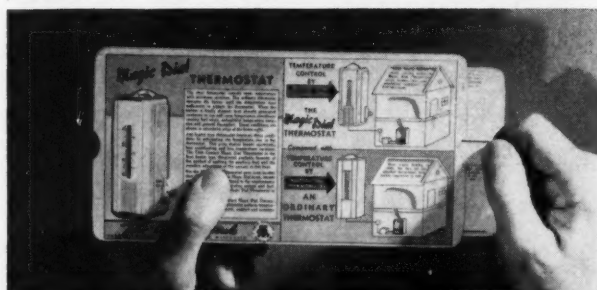
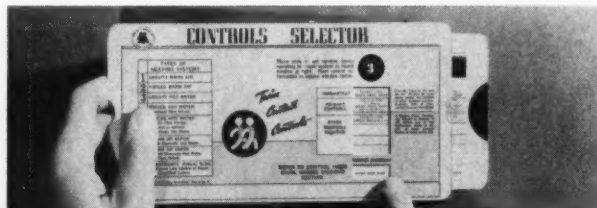
### Revere's Annual Report to Employees

Revere Copper and Brass Incorporated, 230 Park Avenue, New York City, has published a report to employees for the year ended December 31, 1940.

Defense Production and Profits are mentioned in the letter to employees by President C. Donald Dallas. President Dallas calls attention to the fact that there has been little or no advance in price, but that profits have been possible through increased efficiency and increased production. The financial statement for 1940 has been broken down into understandable paragraphs and finally there is a "Long Service Honor Roll" for each division.

### Perfex Offers Controls Selector

Perfex Corporation, Milwaukee, Wisconsin, manufacturers of Twin Contact controls for domestic heating units, has produced a slide rule for selecting automatic controls used with the various standard types of oil burner and stoker installations, including warm air, hot water, steam and vapor systems. The device not only selects



the proper controls, but also gives the number of the corresponding wiring diagrams shown in the controls handbook, published by this company.

By moving the slide, the reverse side shows a comparison between room temperature control with the Magic Dial Twin Contact Thermostat and with an ordinary thermostat. These rules, with the heating unit manufacturer's name imprinted, are furnished to manufacturers of heating equipment employing Twin Contact controls.

### Torrington Contracts for New Plant

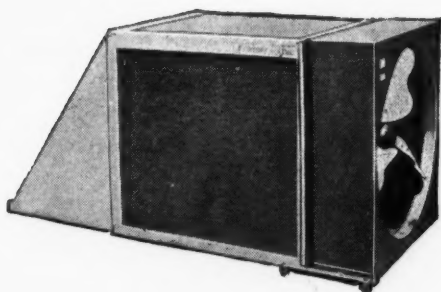
Torrington Manufacturing Company of Torrington, Connecticut, has just contracted for a new building with twenty thousand square feet of additional floor space to be devoted to the manufacture of Airistocrat propeller fan blades and Airotor blower wheels.

The new building will be one story throughout and attached to the present plant, leading to a rearrangement of all departments with increased floor space for each. The offices of the fan division will be moved to the second floor of their present building.

Occupancy of the new building is tentatively scheduled for October.







## SELL HOME OWNERS

### *Low Cost Air Cooling*

Summer home cooling, once considered too costly for the average family, can now be enjoyed by every home owner.

Attic ventilation — the VIKING way — brings it within reach of the modest budget. This is BIG NEWS that means increased sales and substantial profits for you this spring and summer.

## VIKING ATTIC FAN

**Practical and Economical**

**For Any Type House, Large or Small**

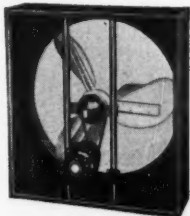
The VIKING Attic Fan is easy to install in any home. Its principle is simple, practical and natural. The large, silent, efficient fan expels the hot stifling inside air and brings in a gentle refreshing breeze of cool night air through the open windows. As soon as the sun goes down the VIKING Attic Fan starts its cooling action, bringing delightful comfort that relaxes and makes restful sleep possible.

The VIKING Attic Package is complete with a standard VIKING Fan unit, sound-proof vent box, automatic ceiling shutter and everything needed for installation. A triumph of VIKING engineering, thoroughly tested and endorsed by thousands of satisfied users as efficient, dependable and economical in operation.

## VIKING VENTILATING FANS

**For Commercial Use**

VIKING Exhaust Fans in a wide range of types and sizes provide the practical solution to the comfort cooling and ventilation problems of many commercial establishments including restaurants, stores, bakeries, dairies, hotels, clubs, offices, funeral parlors, industrial plants, clubs, dance halls.



Write for complete specifications,  
prices and sales helps

**VIKING AIR CONDITIONING CORP.**  
9506 Richmond Ave. Cleveland, Ohio



# STOKER-OLA

## Will Make Any Furnace You Sell Do a Better Heating Job

Here are more reasons for selling STOKER-OLA with its famous gearless drive:

It will make you EXTRA PROFIT . . . It carries a 3-year guarantee . . . Its gearless drive transmission makes prospects "believe their eyes and ears" . . . There is no oil to change—or drip . . . It has unlimited coal-feed adjustments for maximum performance and economy.

### *It Is America's Most Easily Sold Stoker*

Such additional features as a repulsion-induction motor of standard make and its handsome appearance make it an outstanding value — NOWHERE ELSE CAN YOU BUY A 40-LB. CAPACITY STOKER COMPLETE WITH MINNEAPOLIS-HONEYWELL CONTROLS TO RETAIL AS LOW AS



**\$134<sup>00</sup>**

Your PROFITS  
Come From SALES!

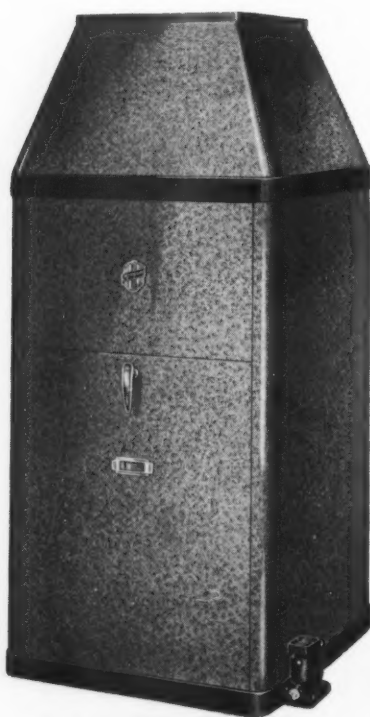
It Earns As  
It Burns.

Model A-4.  
Burning Capacity  
10 to 40 lbs.  
Other models for all needs.

BETTER WIRE OR WRITE QUICK—  
1941 IS ALMOST HALF GONE ALREADY!

**Advance Appliance Co., Inc.**  
808 S. Washington St. Peoria, Ill.

# MONOGRAM Automatic Oilfire Furnaces for Low Cost Installation and Operation



Model No. 75—75,000 B.t.u.

The MONOGRAM Booster Gravity units are designed especially for the home owner or prospective home owner who desires automatic warm air heating at a moderate cost of both installation and operation.

MONOGRAM "Vaporizing" burner has no moving parts—is clean, quiet, trouble-free. Produces a cleaner, hotter, more full-bodied flame by vaporizing the oil quicker and more completely and then adding the proper balance of both primary and secondary air, made possible by the exclusive Air Mixing Feature, and producing the highest known operating efficiency of over 80%.

Blade fan in rear of furnace provides mechanical draft for high fire operation and also provides added circulation. Fan is in operation only when burning on high fire. Only .02 natural draft is needed for low fire operation.

MONOGRAM Automatic Oilfire Furnaces are the furnaces for you to sell for they offer the consumer more for their money and give the dealer greater profits because unnecessary service calls and replacements are eliminated by the trouble-free heating service provided by MONOGRAM'S "Vaporizing" burner.

featuring  
MONOGRAM  
"Vaporizing"  
Oil Burner

•  
Produces a Clean, Quiet Gas Flame Made From Oil.

•  
Highest Known Certified Operating Efficiency of Over 80%.

•  
Absolutely No Soot or Carbon—Dependable—Trouble-Free.

•  
Double Baffle in Heating Drum—Stops rush of heat up chimney—Increases efficiency—Creates Lower Heat Zone resulting in Faster Circulation.

## With the Manufacturers . .

### Personnel Appointments

George McNamara—appointed to the sales engineering staff of Anemostat Corporation of America, Detroit office. Mr. McNamara will assist George Shackelford, Detroit representative for the company in serving architects, engineers and contractors in Eastern Michigan.

J. L. Woodress—appointed Director of Sales for Century Electric Company of St. Louis. Mr. Woodress joined the Century organization in 1907, and after travelling sales and service became successively assistant sales manager, sales manager, and director of sales.

Earl S. Moore—becomes general sales manager of Century Electric Company of St. Louis. Mr. Moore joined Century in 1916 and became export manager in 1920.

J. J. Walsh—appointed assistant sales manager of the Front Rank Furnace Company, St. Louis. Mr. Walsh was connected with the Langenberg Mfg. Co.—who originated the Front Rank line—for some fifteen years. Later he traveled Northwestern Ohio for Marshall Furnace Company, and still later was connected with the sales department of White Rogers Electric Company.

C. Allen Fisk—appointed factory representative for Harvey-Whipple, Inc., Springfield, Mass., covering Eastern Massachusetts and Rhode Island.

B. J. Brugge—appointed welding consultant and engineer at Washington, D. C., by The Lincoln Electric Company, Cleveland. He will be engaged in consulting work having to do with the application of arc welding in the National Defense Program and will be available for such work with all governmental departments. He will be associated with T. A. Canty, Inc., Lincoln representative in Baltimore, Maryland. Mr. Brugge has been associated with Lincoln since 1931.



Morris M. Rose—appointed general traffic manager of Milcor Steel Company, Milwaukee, following the retirement of L. R. Conger, who headed Milcor's traffic department for the past 25 years.

H. J. Hufler—appointed traffic manager for Milcor Steel Company, Milwaukee, in Milcor's eastern district to assist Morris M. Rose, general traffic manager.

Robert L. Clause—elected president of the Pittsburgh Plate Glass Company, Pittsburgh. Mr. Clause joined the company in 1914 as a draftsman. He succeeds H. S. Wherret, who becomes vice chairman of the board of directors.

George Greulich—appointed sales manager of Skuttles Sales Company, in charge of automatic humidifier and ventilator sales.

Paul Lyon—appointed assistant manager of the galvanized sheet and roofing sales division of the Wheeling Steel Corporation, Wheeling, W. Va. (William L. Latta is manager of sales of the galvanized sheet and roofing sales division.) Mr. Lyon joined the organization several years ago and has been identified with the tin plate sales division.

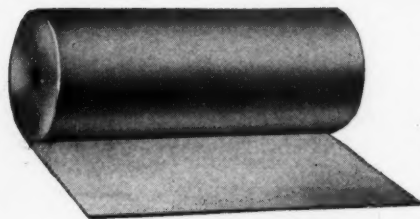
D. L. Irvine—appointed assistant manager of the tin plate sales division of the Wheeling Steel Corporation. Mr. Irvine will move to Wheeling from Chicago where he has been identified with the company in a sales capacity.

I. J. Koehline—appointed assistant manager of the tin plate sales division of Wheeling Steel Corporation. Mr. Koehline has been connected with the lithographing division of the tin plate sales division for some years.

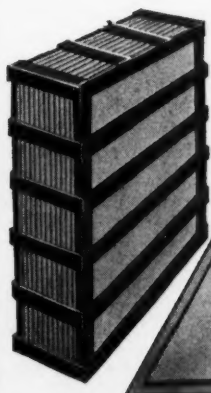
Albert O. Jensen—appointed distributor of air filters by the Research Products Corporation, Madison, Wisconsin, covering Omaha, Nebraska and Council Bluffs, Iowa. Mr. Jensen is located at 1016 Douglas Street, Omaha.

**The Quincy Stove Mfg. Company**  
Quincy . . . . . Illinois

# SAL-MO ASBESTOS PRODUCTS



ASBESTOS PAPER

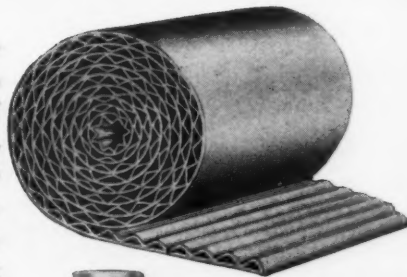


ASBESTOS  
MILLBOARD

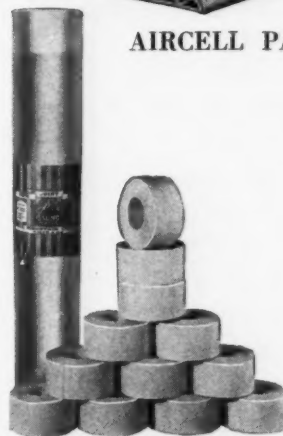


THE SAL-MO reputation for quality asbestos products was gained only through years of satisfactory service. Your jobber has confidence in SAL-MO quality and is in position to quickly furnish you with the right materials for insulating all types of Warm Air Heating and Air Conditioning Equipment, Furnace Cements, Asbestos Coverings for all kinds of Piping—Steam, Hot and Cold Water, and Flexible Asbestos Jackets for Hot Water Tanks. Also Duct insulation for air conditioning, etc.

Your nearest JOBBER is your best source of supply for SAL-MO Warm Air Heating Insulations.



AIRCELL PAPER



PIPE JOINT TAPE

**SALL MOUNTAIN COMPANY**

176 WEST ADAMS STREET  
CHICAGO, ILLINOIS



Niagara Series "BL" Power Squaring Shears combine economy, strength, rigidity, accurate cutting, convenient operation, compactness, visibility, less weight on the floor, low overall height, safety and low cost. They are built with a low slope of crosshead for flat shearing of narrow strips, regular trimming, re-squaring and strip cutting. Latest Niagara self-measuring, ball bearing, parallel back gage is standard equipment. 10 gage capacity in 6, 8 and 10 foot lengths, 12 gage capacity in 12 foot length. Write for Bulletin BL. Niagara Machine & Tool Works, 697 Northland Ave., Buffalo, N. Y. Branches: Cleveland, Detroit, New York.



## News Items . . . . .

### Milwaukee

Robert Lang has opened a sheet metal shop at 224 S. Second St. in Milwaukee, while Frank Kramer has moved his sheet metal shop from 2216 S. Kinnickinnic Ave. to 3145 S. Kinnickinnic. John Emling has completed the erection of a new office on the premises adjacent to his sheet metal shop in West Allis.

### Valley Heating & Ventilating Co.

The Valley Heating and Ventilating Company has been organized at Green Bay, Wisconsin, by Randall Kaye and Elmer Krueger. The firm, engaged in tinsmithing, roofing and repairing, is located at 1207 S. Broadway.

### Kinzel Purchases Ebel Sheet Metal

Otto Kinzel has purchased the Ebel Sheet Metal Works at Two Rivers, Wisconsin, and has changed the name to the Kinzel Sheet Metal Works. Mr. Kinzel has had over 12 years' experience in the sheet metal business.

### Yardstick Booklets

George Boeddener, Managing Director of the National Warm Air Heating and Air Conditioning Association, reports receiving separate orders for the Yardstick booklets from dealers, jobbers, an occasional architect, public utilities, banks, etc., at the rate of one hundred a week. In addition, members have purchased 50,000 copies. The association urges manufacturer members to be sure to make sample copies available to their dealers and jobbers.

Members are requested to anticipate their Yardstick requirements. To obtain a reasonable price from the printer, the association must send in orders in bulk, that is orders from twenty or thirty members for a total

quantity in excess of 10,000 copies. For delivery, two weeks are allowed from the time bulk orders are mailed to the printer.

### Commercial Standard Covering Anthracite Burners

The National Bureau of Standards, Department of Commerce, has just released a pamphlet entitled "Domestic Burners for Pennsylvania Anthracite (Under-feed Type), Commercial Standard CS48-40," which records the minimum requirements for material, design and construction, installation, coal storage, conveying and ash removal systems, bearings, lubrication, draft, fans, controls, capacity, workmanship, and flue connections. Operating requirements are set forth, together with methods for determining ratings and efficiency.

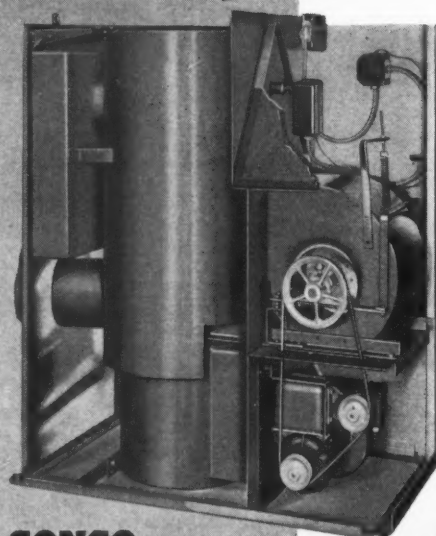
The purpose of the standard is to provide a nationally-recognized basis for certification of quality and performance by the manufacturer, the installing contractor, or by an independent inspection agency or testing laboratory. Buyers may also use it as a basis for performance criteria and tests. It is believed that the application of this standard will protect users from receiving inferior equipment, and the industry as a whole will be protected against destructive effects following the sale of burners that may cause dissatisfaction as a result of over-rating or other improper claims.

The standard records the wording of a manufacturer's certificate and an installer's or contractor's certificate, which are to be placed with each anthracite burner installation and which give certain data and test results pertinent to the particular installation.

The pamphlet also records the membership of the standing committee of manufacturers, distributors, and users to facilitate revision of the standard to keep it abreast of progress. Copies are obtainable from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 5 cents each.

## WHAT ARE YOU WAITING FOR?

# Conco Has Everything!

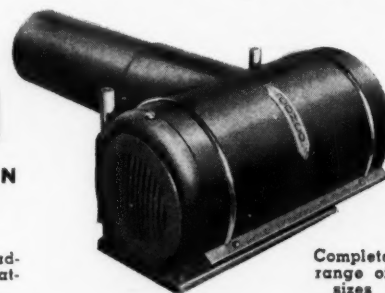


**CONCO  
MINUTE MAN**  
ECONOMICAL AIRCONDITIONING  
FOR SMALL HOMES

Headed up by the new, low-cost, fuel-saving MINUTE MAN Airconditioner for small homes Conco's oil-fired line also includes: (1) The MAJOR series — two airconditioners — for medium and large homes (2) The handsome MAGIC SPRAY CONVERSION BURNER — completely wired and assembled with motor mounted for quick, inexpensive installation. All units finished in green hammerloid. Here's the big-profit, fast selling oil-fired line for your territory. When you get the facts you'll get CONCO. Send a postcard today for full details.

*Featuring*  
**MAGIC-SPRAY  
BURNER!**

**CONCO**  
CONVERSION  
BURNER



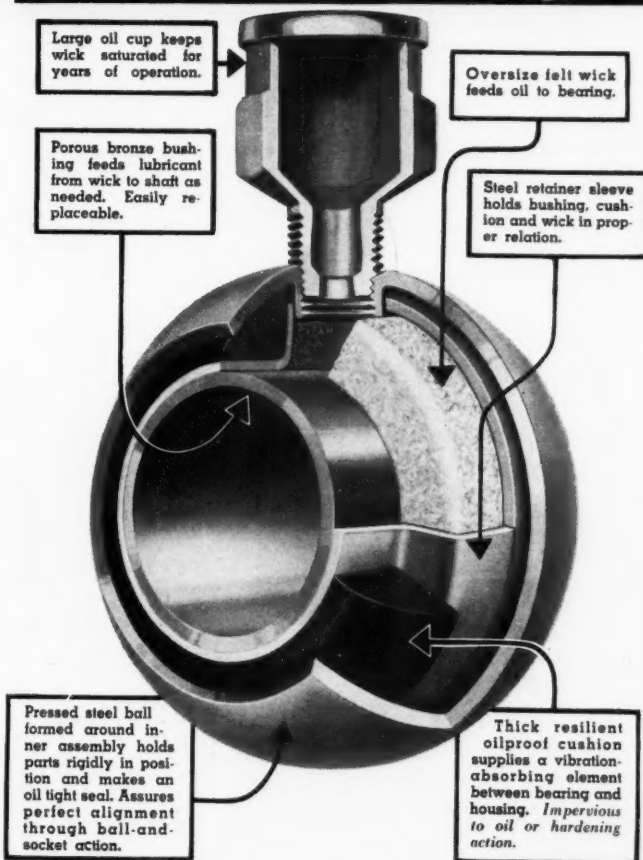
Featuring the most efficient, advanced type of burner in the heating industry.

Complete range of sizes

**CONCO CORPORATION**  
70 EUCLID AVE., MENDOTA, ILL.



# No Other Bearing In Air Conditioning



## has all these QUALITY FEATURES

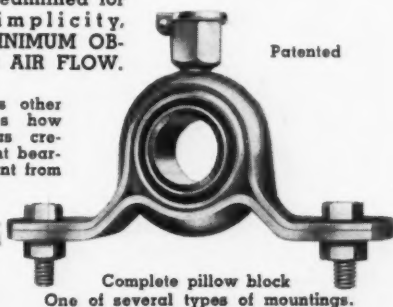
The Triangle Shock-Absorbing Pillow Block is a trouble-free bearing for fans, blowers and other devices requiring silent operation—perfect alignment—and self-lubrication.

1. It is the only bearing for air conditioning that has a resilient oil-proof cushion scientifically built into the bearing—for silence and vibration absorption.
2. Ball-and-socket design for perfect alignment.
3. Scientifically streamlined for compactness, simplicity, strength and MINIMUM OBSTRUCTION TO AIR FLOW.

Cut-away view shows other features and illustrates how unique engineering has created a new type of silent bearing outstandingly different from the conventional.

Triangle design assures high efficiency and low cost operation.

Write for quotations.



**TRIANGLE MANUFACTURING CO.**  
392 DIVISION STREET OSHKOSH, WISCONSIN

## Design Forced Air Jobs Quickly and Accurately With the Aid of This Handy Designing Manual

SECOND EDITION

### FORCED AIR HEATING

215 Pages—6"x9"—clothbound—Illustrated—\$1.00



**Including**  
109 Illustrations  
15 Charts  
23 Formulas  
19 Tables

Into this enlarged second edition has been put, in simple, readily understandable form, ALL the information the contractor needs to enable him to design any forced air heating system correctly and efficiently. It embodies all of the really worthwhile data on forced air heating that has been made available during the past several years, and shows by clear examples how to apply this knowledge properly in actual design work.

In designing a complete winter air conditioning system for a typical residence step by step, this practical manual outlines a model procedure of design, based on wide experience, which the contractor may follow with confidence on any of his own

jobs. It also gives him a new data sheet, the use of which makes it impossible to overlook any factor in figuring the heat load, and shows in complete detail how to fill it in.

Every thought and device to make the new **FORCED AIR HEATING** a practical, everyday guide to correct procedure in forced air design work has been included in it.

Every contractor who is anxious to avoid mistakes and wasted time in forced air work should own a copy of this book. Send \$1.00 today to the address below for your copy. You may order with the privilege of returning the book within ten days for a refund, if for any reason it should prove unsatisfactory.

### CHAPTER HEADINGS

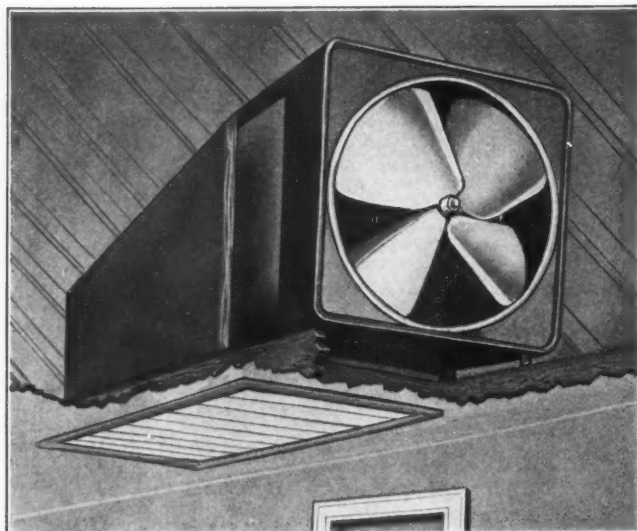
- 1—A Suggested Data Sheet
- 2—Procedure of Design
- 3—Sizing the Apparatus
- 4—Infiltration
- 5—Registers and Returns
- 6—Multiple Registers
- 7—Return Air Systems
- 8—Selecting Register Temperatures
- 9—Temperature Drop in Ducts

- 10—Mechanical Code for Forced Air Heating
- 11—Sizing Ducts by Friction Chart Method
- 12—Sizing Extra Long Runs
- 13—Pressure Losses
- 14—Velocities
- 15—Proportioning Losses in Heating Systems
- 16—Branch Take Offs

- 17—Volume Dampers
- 18—Bonnets and Plenums
- 19—Casing Baffling
- 20—Chimneys and Drafts
- 21—Air Conditioning Radiator Heated Houses
- 22—Automatic Control
- 23—Contract and Specifications
- 24—The Index

**KEENEY PUBLISHING COMPANY** 6 North Michigan Avenue  
Chicago, Illinois

# When heating sales slump — be a COOLING MAN and earn EXTRA PROFITS!



ATTIK-PAK MODEL SHOWING AUTOMATIC CEILING SHUTTERS

From the sale of



Comfort Cooling

Heating men everywhere are becoming "cooling men" during their usually dull season. They have found that home ventilating equipment is a profitable spring and summer line, because it provides their customers with effective hot weather comfort at a reasonable price.

They have found, too, that the line to push is REX-AIRATE, because:—

- ...the "Attik-Pak" model, pictured above, comes complete with all-steel vent box and ceiling shutters;
- ...this model requires little time to install, leaving the seller more free for constructive sales effort;
- ...it is not necessary to cut profit margins to meet price competition, for REX-AIRATE offers features obviously worth the difference in price;
- ...there is a REX-AIRATE for every need priced from \$49.90. For full details—

WRITE TO



Division of the Cleveland Heater Co.  
1937 W. 114th ST. CLEVELAND, OHIO

## News Items . . . . .

### Proposed Fuel Oil Tax

The American Petroleum Industries Committee, 50 West 50th Street, New York City (Baird H. Markham, Director), calls attention to the two identical measures pending in Congress which would impose a federal tax of 2c a gallon on the sale of fuel oil, namely, the Boland Bill (H. R. 6) and the Flannery Bill (H. R. 1019).

The tax, if passed, would be levied on fuel oil used in the generation of heat, or power, except that which is used as fuel in internal combustion engines.

### "Streamlined" Sheet Metal Training

(Continued from page 73)

flanges of the posts and were bolted to the posts.

A school locker constructed along the foregoing plan is of pleasing appearance, notably so after it has received proper paint-finish, is inexpensively constructed and has all the advantages of the regular school locker costing upwards of seven dollars. Patterns for the several parts of which the cabinet is joined together are few in number and the layout of them is comparatively easy. But for purposes of instruction, the patterns should be provided with all the markings, the brakings, the notches, the number of rivet holes and all the other provisioning. The layout should be of a nature convincing the students that it is possible to make all

## QUALITY EQUIPMENT--FROM HESS-- COSTS LESS

### DEALERS---Write for our New 1941 Portfolio

By selling — repairing, modernizing or replacements, needed by owners of a majority of heating plants now in use.

• • • • •  
HESS BLOWER FILTER UNITS  
HESS WELDED STEEL FURNACES  
HESS AUTOMATIC OIL BURNERS  
HESS AUTOMATIC COAL STOKERS

ARE GREATEST VALUES  
AT LOWEST PRICES

• • • • •  
The Hess line is complete for every dealer requirement, distinctively different and more saleable. Financing plan and territory plan—helps Hess dealers.

WRITE FOR DEALER PORTFOLIO  
HESS WARMING & VENTILATING CO.  
1211-27 S. WESTERN AVE. Founded 1873  
CHICAGO, ILLINOIS



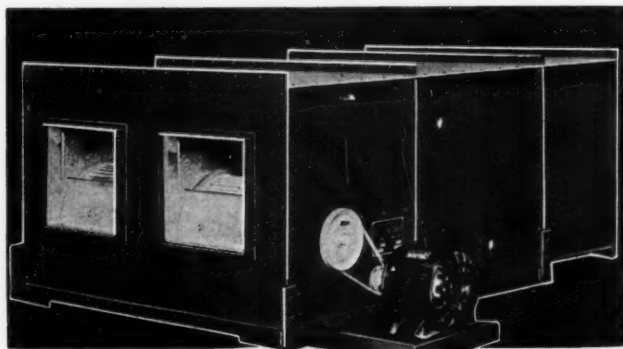
the provisions in flat, with the formed parts fitting snugly one to the other, the rivet holes corresponding, the whole cabinet construction and assembly just a matter of shearing, provisioning, notching, forming and braking, flanging respectively, by closely following the pattern.

#### Students Like Production Work

It has been found that the students, young and old, are interested in, and enjoy, this kind of work. The hundreds of pieces to be made, one like the other; the men working on distinct operations or a number of them performing one and the same operation, soon assumes the aspect of a game, a competition, with the sweating but smiling workers wondering how the time flies.

This, although important in making the student like his work and persist in learning more and more of it, is surpassed in beneficial results by the fact that the student is being prepared, by the work he does in school, for work in the outside shop and in the factory needing additional help on projects of the National Defense for which right now, men are being trained in trades.

The student who has done quantity shearing of blanks by patterns—shearing on a three-foot school squaring shears—will need little additional advice or practice doing that same work on the factory power shears. The man who has braked parts by patterns and template on a four-foot



# CLARAGE

## Multitherm Units

✓ Cooling  
✓ Heating  
✓ Complete Conditioning

Finest type of equipment available for small summer cooling, winter heating or complete year-round air-conditioning jobs. Widely used in factories, offices, stores, etc. Highly efficient; remarkably compact; easily installed in any idle space.

Write for Bulletin 107 describing various arrangements and giving capacity ratings.

CLARAGE FAN COMPANY  
872 PORTER STREET • KALAMAZOO, MICH.  
Sales Engineering Offices in all Principal Cities

Designed to control temperature and humidity within close limits. Can be made completely automatic in operation, regulated by room thermostat and humidistat.



### A MONEY MAKER FOR YOU!

★ "PACIFIC" A-80 is a furnace that will warm your heart . . . fatten the old bank account and make your customers happy for evermore! It's built in two *easily handled* sections. Interchangeable casing panels and reversible blower permit quick and easy transposition of Heating and Blower Units, in the shop or on the spot. Simply bolt them together when you've decided on the best arrangement. It saves you effort . . . saves you time . . . saves you money. And your customer gets a gas-heating and ventilating unit of utmost efficiency, low cost operation, long reliable service and *lower initial cost* than the same elements in a single cabinet.

★ Give your business a lift with this 1941 money-maker...the "Pacific" A-80.

Write Dept. AA-3.  
**PACIFIC GAS RADIATOR CO.**  
Huntington Park, Calif.

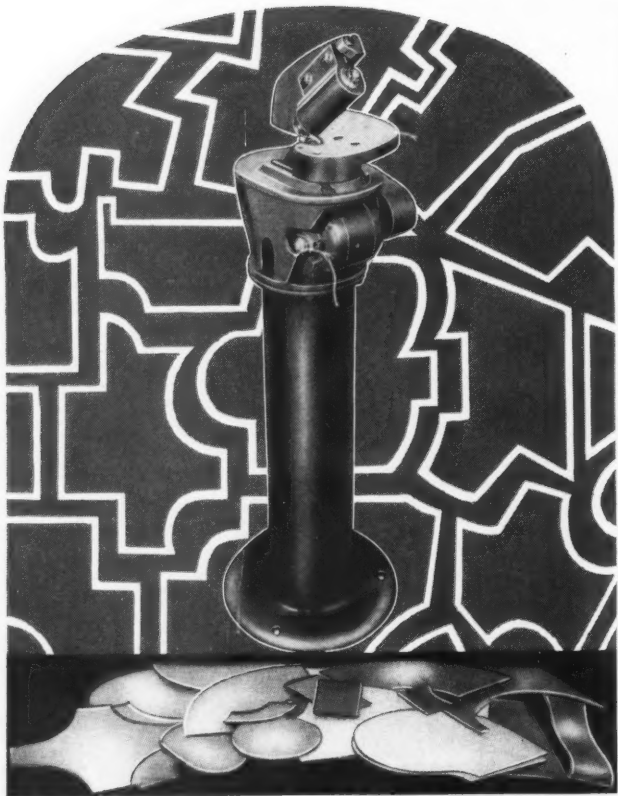


"Pacific" Round Heating Element, an innovation in gas furnace design. Recovers a higher percentage of heat units to input than any other heating element. Rigid, durable, welded gas-tight, leakproof.



"Pacific" Multi-Tubular Burner produces maximum flame temperature . . . more heat at less cost. No adjustments required. Heavy cast-iron fire-box liner above protects side walls of element.





## You can cut a Jig-Saw Puzzle with **QUICKWORK 14-16**

Quickwork Combination 14-16 Rotary Shear and Flanger is a compact, versatile, low-cost unit that will handle a wide range of sheet metal fabrication.

*Because of the smooth, even action of the self-feeding cutter, it is easy to follow even the most intricate layout.*

As a shear, Quickwork Combination 14-16 will handle all straight and irregular cutting, including full curves and circles, both concave and convex. A simple, quick change of heads changes the machine into a flanger which is equally simple and easy to operate.

**DESIGNED FOR UTILITY**—Quickwork Combination 14-16 is designed for greatest utility, as both a shear and a flanger—as bench type or pedestal mounted machine—for production shop work or portable equipment out on the job. The machine is arranged for two cutting and flanging speeds which can be varied to meet special requirements.

Quickwork Combination 14-16 shears 14-gauge metal—flanges 16-gauge—has a standard speed of 5 and 10 feet per minute. Shipments of Quickwork Combination 14-16 are possible from stock—subject to prior sale. For complete information on this compact, low-cost unit, write today to Quickwork-Whiting Division of Whiting Corporation, Harvey, Illinois.

**WHITING CORPORATION**  
HARVEY, ILLINOIS

### QUICKWORK

Rotary Shears • Circle Shears • Seamers • Beaders • Power Bumping  
Hammers • Flangers • Stamping, Trimming and Forming Machines  
Manufactured by  
Quickwork-Whiting Division of Whiting Corporation, Harvey, Illinois

hand brake will, after induction to a power brake or a press brake, prove a satisfactory brake operator in a factory. And the man who has used tools in flanging and fitting parts going into assembly will feel at home in a factory—only the surroundings having changed, but not the work!

Familiarity with the work demanded of mechanics and machine operators in a modern production plant is more advantageous to the new help than is the absolute competency of doing the work. The habit acquired in school, in such work as of a hundred lockers produced by modern quantity standards, the quick handling of the parts, the uniformity of the work done on the parts, that is what counts in production. It will recommend the man to the group leader and the superior, it will pave the way for him with his co-workers, it will make a real valuable worker of him in no time. And the objective of the present training will have been attained.

## Michigan's Proposed Licensing Bill

*(Continued from page 89)*

form of license is by ordinance required in order to undertake or perform the installation of warm air heating and/or air conditioning equipment, every such license which has been issued prior to the date upon which this act goes into effect shall continue in force

## THERMO-DRIP *Automatic* HUMIDIFIER

on any furnace quickly proves that correct humidification is more than a matter of merely keeping water pans *filled*. Its principle of feeding a given amount of water at a specific degree of heat in the furnace means **MEASURED** moisture—a vital factor in providing comfortable, healthful warmth in furnace heated homes. Sell measured moisture—there's more customer satisfaction and more profit in it for you!



*Ask Your Wholesaler or Write Us  
For Complete Details*

**AUTOMATIC HUMIDIFIER CO.**  
18th and Main Streets CEDAR FALLS, IOWA

until the date of its expiration according to the ordinance under which it was issued, except that no such license shall continue in force for a period of more than one year after the date upon which this act goes into effect, and thereafter no such license shall be required by the municipality.

#### Disposition of Fees

Section 16.—Except as provided in section 7, all funds received by the board in the form of fees or from any other source shall be paid into the general fund of the state and all necessary expenses are hereby appropriated from the general fund for the use of the board in carrying out the provisions of this act and shall be paid out by the state treasurer upon vouchers approved by the chairman of the board to meet the payment of all expenses actually incurred.

#### Records of the Board

Section 17.—The board shall keep a complete record of all meetings and all other transactions. The same must be kept on file for a period of at least three years and shall be open to public inspection on demand. The board shall keep a record of all licenses and certificates issued by it and shall have printed a manual of its rules and regulations for the conduct of examinations.

#### Penalties

Section 18.—Any person, firm or corporation who shall violate any of the provisions of this act shall be guilty of a misdemeanor and upon conviction thereof shall be punished by a fine of not less than twenty-five (\$25.00) or more than one hundred (\$100.00) dollars or imprisonment in the county jail

**Don't Compromise**  
**ALWAYS INSTALL**  
**The FIELD BAROMETRIC DRAFT CONTROL**

**BALANCED AT FACTORY** **MADE OF HEAVY MATERIAL**

**DOESN'T CLOG OR WARP** **ROCKER TYPE FULCRUM**

**QUICKLY RESPONSIVE** **FREE SMOKE PASSAGE**

**TYPE M**



• Proven in the laboratory and in the field to be the most responsive and accurate of draft controls. Rigidly constructed to a design that provides for permanent, service-free draft regulation. Factory balanced—with another special adjustment made for each individual installation. Write for literature.



TYPE "U"

• The Field Control line is complete with the 6" Type "U" Control for coal and oil-burning heaters and the Motorized Type "M" Control in sizes up to 20". Also a complete line of Commercial Controls. Write for literature.



MOTORIZED

**FIELD CONTROL DIVISION MENDOTA, ILLINOIS**

**"BUSINESS IS  
BOOMING—BUT WE  
CAN STILL FILL  
YOUR ORDERS!"**

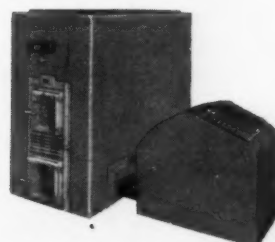


**Y**ES, business here is really booming and everyone is working at top speed. But—thanks to Round Oak's complete manufacturing facilities and to the foresight of its management—your orders can still be filled promptly. In fact, most units of the complete Round Oak line (cast and steel furnaces, air conditioners, oil burners and stokers) are available on short notice. So take advantage of everything Round Oak has to offer and keep your business booming, too!

#### 70th ANNIVERSARY MODELS



**Blended-Iron Gravity Furnace.** Low in cost, leader in "small budget" home market.



**SPX Stoker Furnace and air conditioner.** Extensions on either side for Round Oak stoker or any standard make.



**XB Oil Furnace** performs all functions of heating and air conditioning. Complete with Round Oak's oil burner.



**S Boiler Plate** steel gravity furnace of welded gas-proof construction. In all sizes.

**—To Assure Early Delivery,  
Place Your Orders  
NOW!**



**ROUND OUT**  
 WITH  
**ROUND OAK**  
*of Dowagiac, Mich.*

THE COMPLETE LINE OF FURNACES  
OIL BURNERS AND STOKERS



**PAYNE**  
More Than a Quarter-Century of  
Specialization

# WHY I'M GLAD I SELL PAYNEHEAT

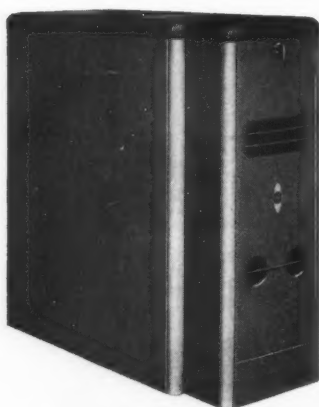


"In the years I've sold and installed PAYNE Gas Heating, I've made both friends and money. The goodwill that PAYNE quality creates has real *cash value* for the Dealer or Gas Company.

"All this time PAYNE has constantly raised gas heating standards, and played fair with us in every way. Believe me, it's a great feeling to deal with a manufacturer like that.

"If you were to ask my advice, I'd say you can stake your reputation as a Dealer on PAYNE-HEAT!"

*A few territories are open for PAYNE representation. Address J. H. Keber, Sales Manager.*



**ZONEAIR UNIT**  
Heats, circulates, filters, ventilates, and humidifies . . . automatically. Services one room, a wing, or entire house.

*ALSO Floor Furnace, Forced Air Unit, Modern Console, Gravity Furnace, Spacesaver Unit, Duplex Furnace.*

**PAYNEHEAT**  
*Payne* FURNACE & SUPPLY CO., INC.  
— BEVERLY HILLS • CALIFORNIA —

for not more than thirty (30) days or by both such fine and imprisonment at the discretion of the court. If such person, firm or corporation is the holder of a license of any class provided for in this act, such conviction shall have the effect of suspending said license until such time as it shall have been reinstated by the board. Each violation shall be considered a separate misdemeanor.

#### Liability for Damage




Section 19.—This act shall not be construed to relieve or lessen the responsibility or liability of any party owning, operating or controlling or installing any gravity warm air heating and/or air conditioning equipment for damages to persons or property caused by any defect therein, nor shall the State or any municipality be held as assuming any such liability by reason of the inspection or examination authorized herein or the certificate of approval issued therefor as herein provided.

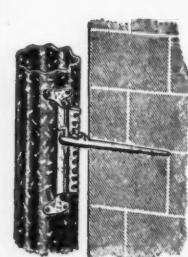
#### Validity and Repeal

Section 20.—If any section, sub-section, sentence, clause or phrase of this act is for any reason held to be unconstitutional, such decision shall not affect the validity of the remaining portions of this act. The legislature of the State hereby declared that it would have passed this act and each section, sub-section, sentence, clause, or phrase thereof, irrespective of the fact that any one or more sections, sub-sections, sentences, clauses or phrases may be declared unconstitutional. All acts or parts of acts in conflict with the provisions of this act are hereby repealed.


## -BB-

### SHANKS and CIRCLES



**CONDUCTOR  
HOOKS  
AND  
FASTENERS**



Wood Hook

The only really complete line of hooks and hangers. Send for complete descriptive literature.

*Sold Through Leading Jobbers Everywhere*

**BERGER BROTHERS COMPANY**

Main Office & Factory  
229-237 Arch St.  
Philadelphia, Pa.

Branch  
16th & Grove Sts.  
Jersey City, N. J.

## 100% Overhead On Productive Labor

(Continued from page 91)

From 1919 to 1929 Overhead on Productive Labor remained under 100 per cent; from 1932 to 1939 it increased until 1939 when statements received showed 125 to 150 per cent of Productive Labor due, of course, to the decrease in business and the addition to the tax items.

"Try and get it." We had better get it or we will live to "weep" at the end of the year. More and more shops are doing so to their profit. For every mechanical, legitimate shop to do likewise will very materially assist in the recovery of the position that our trade deserves. Forget COMPETITION.

## Neubecker Pattern For A. C. Fittings

(Continued from page 62)

tern for bottom, then will  $H^x-G^x-G^o-H^o$  show the half pattern for bottom  $H-G$  in elevation.

As 1-4 in section A in side elevation is greater than  $1^o-4^o$  in section A°, a line must be drawn from D to H in side elevation on which a bend

## SPEED UP NATIONAL DEFENSE ORDERS with Libert Hi-Speed Shear

Save time and money—  
increase production —  
with LIBERT Hi-Speed  
SHEARS. One machine  
cuts variety of shapes  
without special adjust-  
ments. Cuts rings,  
circles, flat or formed  
pieces . . . plain or in-  
tricate shapes . . . in  
sheet metal, stainless  
steel, and expanded metals  
up to and including 10-  
gauge mild sheet metal.

Ask your LIBERT distribu-  
tor for a demonstration or  
write TODAY for latest  
bulletins on our complete  
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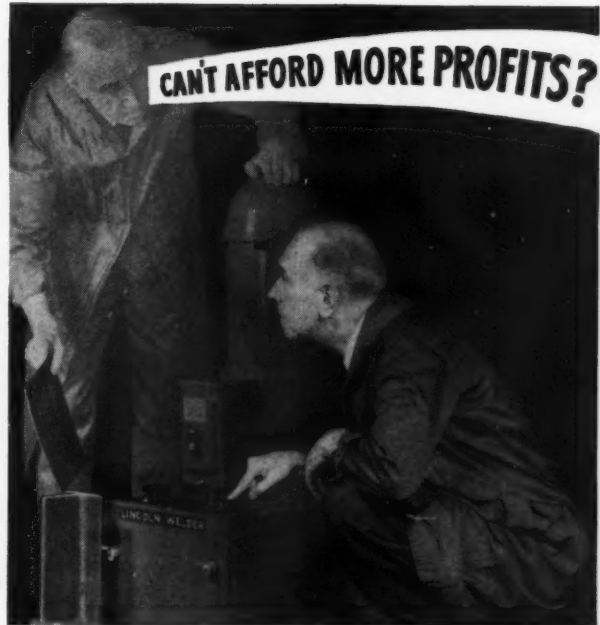


### LIBERT MACHINE COMPANY

322 North Roosevelt Street  
Green Bay, Wisconsin

"Manufacturers of Shears Since 1915"

# Libert Hi-Speed SHEAR



**ALTER EGO:** Literally "one's other self"—the still, small voice that questions, inspires and corrects our conscious action.

**ALTER EGO:** Be honest, wouldn't you like to bank the swell addition to our profits by being local headquarters for arc welding?

*Yes, but I can't afford an arc welder. There isn't enough call for arc welding.*

**ALTER EGO:** Perhaps the reason we don't GET calls is because we don't MAKE calls. Let's call for business on all construction work now going on around here. Let's call for business on the jigs and fixtures and parts-making in some of the overloaded factories.

*True! Put that on top of our regular work and it would be profitable, all right.*

**ALTER EGO:** So, now you agree we CAN afford to make more profits, eh?

**LINCOLN SUGGESTS:** Thousands of shops like yours are taking on new, profitable lines of business with this new "Shield-Arc Jr." (price only \$148 for 75-amp. size). "Job Selector" can be set for the right TYPE of arc to suit the job. Current Control gives any desired arc INTENSITY. Full details in Bulletin 313.

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**LINCOLN SHIELD-ARC WELDING** THE LINCOLN ELECTRIC COMPANY  
Cleveland, Ohio  
Largest Manufacturers of Arc Welding Equipment in the World

The self-cleaning radiator, and the cellular firepot are important sales points which will help you sell this WISE Series "A" Gravity furnace to your value-minded customers.



## Go After Spring Profits Now—Sell Wise Furnaces

You won't find a better time than right now to sell your prospects on the advantages of a new WISE Furnace. Many of them have been putting it off for so long that their old heating plants are no longer in a repairable condition and an aggressive selling campaign on your part is really all that's needed to make them want a modern, efficient, economical heating unit in their homes.

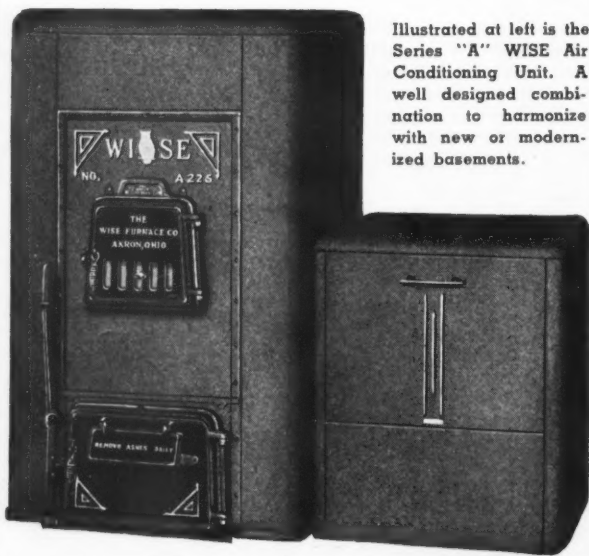
Check over your list of customers NOW! Clean out the dead ones and compile a list of real, live prospects—then go after them with full literature and information on the WISE Line. You'll be surprised at the response.

Write us today for catalog and literature on all of the WISE Units.

## THE WISE FURNACE COMPANY

AKRON

OHIO



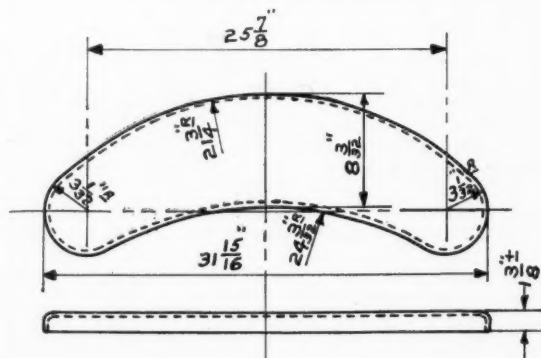
Illustrated at left is the Series "A" WISE Air Conditioning Unit. A well designed combination to harmonize with new or modernized basements.

must be made when forming the cheeks which makes the twist or the half difference between the wide and narrow side of the sections A and A° above referred to. The true length of the line drawn from D to H in side elevation is found as follows: Take the distance D-H and set it off at the right as shown from H<sup>v</sup> to D<sup>v</sup>. Draw perpendiculars from H<sup>v</sup> and D<sup>v</sup>, making H<sup>v</sup>-m and D<sup>v</sup>-n equal respectively *one half* of the *narrow* and *wide* sides of either sections A or A° in side elevation.

Draw a line from m to n in the true length, which will show the true length of the bending line D-H in side elevation. The pattern for the center or transition piece of the elbow is now in order. In laying out the transition piece the seam will be made along the bottom H-G in side elevation. Therefore take the distance of the top line C-D in side elevation and place it on the vertical line below as V-W. Through V and W draw horizontal lines as shown and make the distances W-D and V-C on both sides of the center line equal respectively to *one half* of the *wide* and *narrow* sides of either sections A or A°. Draw lines in the transition pattern from C to D on both sides.

Now with C-H in side elevation as radius and C in the pattern as centers describe short arcs near H and intersect them by arcs struck from D as center with the true length m-n as radius.

## RADIATOR CRESCENT HEADS



• "Commercial" Crescent heads are designed to minimize the amount of material required and to shape the radiator to give the best thermal efficiency. Heads are formed cold and of one piece. The flanges are of sufficient length to allow riveted or welded construction. All heads are exactly the same so that wrapper sheets can be formed and the radiator assembled with speed and economy.

THE COMMERCIAL SHEARING & STAMPING CO.  
YOUNGSTOWN, OHIO



Draw lines from *C* to *H* to *D* on both sides of the pattern. Now with *D-G* in side elevation as radius and *D* in the pattern as centers describe short arcs near *G* and intersect them by arcs struck from *H* as center with *H°-G°* in the pattern for bottom as radius. Draw lines from *H* to *G* to *D* on both sides.

*G-H-H°-G°* in the transition pattern is a reproduction of similar letters shown in the half pattern for bottom. When the offset is of a small size, this can easily be traced. When the offset is of a large size, this half bottom pattern can be reproduced as follows: With *G°-G°* in the bottom pattern as radius and *G* in the transition pattern as center draw short arcs near *G°* and intersect them by arcs struck from *H* as centers with *H°-G°* in bottom pattern as radius. Draw lines in transition pattern from *G* to *G°* to *H*. Now with *H°-H°* in bottom pattern as radius and *H* in transition pattern as centers draw short arcs near *H°* and intersect them by arcs struck from *G°* as centers and *G°-H°* in the bottom pattern as radius.

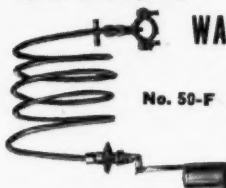
This completes the net pattern for the transition laid out in one piece. If the transition is of a large size it can be made up in two or four parts. As mentioned in connection with Fig. 50, slight bends must also be made in the transition pattern shown in Fig. 51 as indicated by the shaded angle *t*. All bends will be outside angles.

## HERE'S *Efficiency Plus* IN AUTOMATIC WATER FEEDERS!

Accurate control of water levels in Humidifiers for all types of warm air furnaces is easily achieved with the use of any of Maid-O'-Mist's Automatic Water Feeders. Easy to install . . . free from corrosion . . . foolproof and lasting in their action. They do their job faultlessly and give complete assurance of utmost efficiency. No. 59F Water-Boy Feed Valve is an excellent waterline control valve. Built of brass, copper, Monel and nickel silver, eliminates the possibility of corrosion. The valve is brass, nickel plated with removable heat and oil resisting inceased Neoprene washer. Operation is protected by a Monel metal filter screen. Comes complete ready to install, with 6 ft. of 1/4" O. D. copper tubing, and a quick hookup saddle valve. Approved by Nat'l Plumbing Laboratory Against Back Siphonage.



No. 59-F



No. 50-F

### WATER BOY MIDGET FEEDER

For bucket or pan type humidifiers. Is 7" long over all. Nickel plated copper float operates in water only 1" in depth. Adjustable. Valve is brass, nickel plated, with replaceable Neoprene washer. Is protected from dirt, pipe scale, etc., by a Monel metal screen. Easy to install. Comes complete with 6 ft. of 1/4 inch O. D. copper tubing and a No. 8 Quick Hook-up Saddle valve.

### ALSO MANY OTHER TYPES

Maid-O'-Mist also manufactures many other types of Midget Water Feeders. The No. 51...No. 55...No. 56...No. 57...all operate perfectly under any conditions. Each has its specific purpose and the one best suited for your use is included in this extensive line. Write for full information at once.

MAID-O'-MIST HUMIDIFIERS ARE STANDARD EQUIPMENT ON MANY OF THE COUNTRY'S LEADING FURNACES!

# MAID-O'-MIST INC.

213 NORTH ABERDEEN STREET  
CHICAGO ILLINOIS

**AUTOMATIC  
HUMIDIFIERS**  
FOR ALL TYPES OF  
HEATING SYSTEMS



## One Stop BURNER SERVICE

Regardless of the type of burner you require—Pre-mix, Venturi, Gas actuated fan, Center fire register, or Multi-jet—there is a John Zink Burner of the proper type and size to fill your requirements.

If you are using any of the above types of burners—John Zink can give you a more efficient and economical burner.

We are willing and capable of designing and manufacturing special burners for special purposes.

## 32 DIFFERENT TYPES

### SERIES "V" BURNER

Pre-Mix Type—absolutely noiseless—especially good for boiler installations in churches, schools, and apartments.

### SERIES "R" BURNER

Refractory Type—especially good for installing in boilers having very low draft and small combustion space.

### SERIES "S" BURNER

Popular Zink Star Type—simple, sturdy, and efficient—especially good for installations in power boilers.

### CONVERSION FURNACE BURNERS

Luminous Flame Type—fits 98% of all domestic furnaces—tested, approved, efficient and economical.

### JOHN ZINK FLOOR FURNACES

Made in three sizes—25,000, 50,000, and 70,000 B.t.u./hr.

### SEE OUR EXHIBIT—

Booth No. 154 Pacific Heating and Air Conditioning Exposition—San Francisco—June 16-20th.

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TULSA, OKLA.—4401 S. PEORIA AVE.

Chicago, Ill.—7309 E. End

New York City—342 Madison Ave.

Dallas, Texas—2405 S. Harwood

Houston, Texas, 4433 Leland Ave.

# MORE PROFIT ON GUTTER JOBS — WHEN YOU USE THE GRAY GUTTER HANGER

The makers of Gray "Snap-Rite" Pipe and Fittings also produce Gray Gutter Fittings—the finest equipment you can buy. Workmanship and materials are the highest, but the price is remarkably low.



The Gray Gutter Hanger, a one-piece combination, is used in place of the No. 10 shank and circle. Quickly erected, it is both strong and ornamental.

Gray Gutter Fittings are easy to work with because they are designed and built by men who understand your problems in installation. Don't be content with anything but Gray quality and workmanship. They cost no more.



An outstanding feature of the Gray Gutter Hanger is the reinforcement finger which extends up behind the head as shown in this illustration, preventing sagging when a ladder is placed against the gutter.

Low in Price—Quicker to Erect

Write today for descriptive matter and prices on Gray Gutter Fittings. Once you work with them you'll agree they are the finest money can buy.

**GRAY METAL PRODUCTS CO.**  
ROCHESTER • NEW YORK

## Snap-Rite

## Outside Riser Saves Office Disturbance

(Continued from page 64)

The fan and cooling coils were enclosed in an angle iron frame on which sheet panels were fastened as shown. The housing also constitutes a plenum from which supply and return ducts are run horizontally as shown in the photograph.

This installation plan eliminated practically all interference with usual daytime bank business. Also, most of the difficult installation work was thereby handled outdoors or in the basement and only two wall openings where the mains enter the building were required. The small ducts inside the room were erected quickly and with a minimum of disturbance.

All metal work in the floors cooled is painted to match the ceiling.

## Installation and Use of Attic Fans

(Continued from page 68)

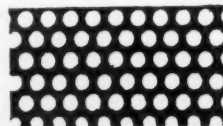
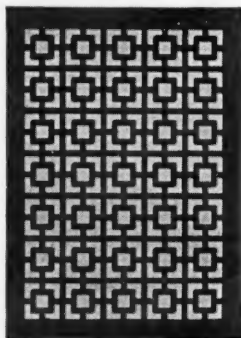
pass through the ceiling grille, the interior of the suction box should be painted a dull back. No appreciable disturbance of attic insulation will be created by an attic fan. However, a few feet immediately in front of the fan should be floored, or a thin "soupy" mixture of cement and water should be sprinkled over the insulation to form a protective crust.

## PERFORATED METALS

Many designs of Perforated Metal for Architectural Grilles, Radiator Enclosures, Air Conditioners, Cabinets, Safety Guards, and for all screening and sizing operations.

Steel, Stainless Steel, Brass, Bronze, Copper, Monel, Aluminum, Zinc and other metals or materials perforated to your order.

Round holes from .020" to 7". Slot holes from .008" to 3" wide. Square holes of standard sizes. Complete line of brass and tin in small sizes. Prompt Service—Pleasing Prices.



Send us your next specifications.

(Note: Equally spaced holes make for uniform strength, improved appearance and durability.)

The **Harrington & King**  
PERFORATING CO.

5649 Fillmore St., Chicago, Ill. New York Office, 114 Liberty St.

Figs. 17 and 18 are photographs of the so-called "northern type" of attic fan installation, in which the entire attic is employed as a suction box. This type of installation can be used only in very tight attics which have been sealed, and it is not recommended for use in the South where attics ordinarily are so loosely constructed. In this installation the ceiling grille is located in the usual manner, but instead of placing the fan in the end of a suction box, it is mounted in a gable wall. Either a fixed louver or one of the automatic types, as shown in Fig. 18, may be used. However, even with tight attic construction, the suction box type of installation usually proves more satisfactory.

[To Be Continued]

## FHA's New Heating Requirements

(Continued from page 51)

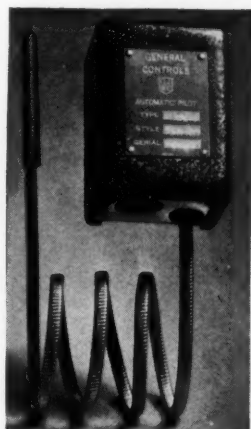
### H. Fire Retarding:

Wood ceiling construction over heating units shall be fire retarded for a distance of 8 feet in front of unit and 4 feet on all other sides, with  $\frac{1}{2}$  inch gypsum board and 28 gauge metal, or  $\frac{3}{4}$  inch thick cement plaster on metal lath.

### 1. Vents:

All gas fired equipment that is automatic in operation shall be connected to a vent that must extend 8 feet above the highest point of the roof.

## \* GENERAL CONTROLS \*



### THERMOPILOT A-100

The proven thermocouple principle of operation is employed on these automatic shut-off controls. When pilot flame is applied to thermocouple element, electrical contact is made, allowing the main electrically operated gas valve to open or remain open. Should pilot flame extinguish, circuit opens and valve closes. Automatically recontacts when pilot is relighted. For two-wire controls; standard couple lengths 18" and 30".

### AUTOMATIC GAS SHUT-OFF CONTROL Thermocouple Type



### THERMOVALVE MR-2

For direct gas line control the Thermovalve utilizes the same thermocouple principle operation, but permits a manually reset valve to shut off the gas flow directly, without the use of any outside current or other devices. Valve and disc parts suitable for butane, manufactured and natural gas at not more than 2 lbs. pressure. Valve sizes  $\frac{3}{8}$ " to  $1\frac{1}{2}$ ". Standard couple length 30". Tip of thermocouple will stand up to 1500° F.

Write for Catalog today.

**GENERAL CONTROLS**

267 Fifth Avenue  
New York City, N. Y.



450 East Ohio Street  
Chicago, Ill.

# NO BETTER NAME THAN COLE

## Cole's Gas Fired Floor Furnaces Are the Quick-Selling Answer to Scores of Heating Questions

Selling Cole's Gas Fired Floor Furnaces pays big dividends in dollars and in customer satisfaction. In new homes for the finest in low cost automatic heat, sell Cole . . . for old homes, replacement jobs or for auxiliary equipment, sell Cole. NOW is the time to talk Cole's Gas Fired Floor Furnaces and NOW is the time for you to cash in on the demand for economical, trouble-free, dependable heat.



Cole Gas Fired Floor Furnaces are approved by the AGA. A full vitreous porcelain enamel inner heating unit assures the most in durability and efficiency.

Other features include large heating surface and long delayed flue travel for maximum heat from any gas; unit crimped and sealed by a patented process for gas tight and stay tight construction; three walled casing

of galvanized steel or full porcelain casing at small extra cost.

Combination safety pilot and automatic thermostatic control also available.

Write for full details today!



**COLE HOT BLAST MFG. CO.**  
3108-26 WEST 51st STREET • CHICAGO, ILL.



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## Sell Comfort Cooling



CAPACITIES 2500 to 10,000  
C. F. M.

EVAPORATIVE COOLING,  
LOWEST IN ALL COSTS, IS  
SWEEPING THE COUNTRY

**Kooler-aire**  
PACKAGE UNITS

COOL, CLEAN, WASH,  
FILTER AIR IN STORES,  
TAVERNS, SHOPS, BEAUTY PARLORS, OFFICES, HOMES

You can make money bringing Kooler-aire comfort cooling to the average business and home. Kooler-aire is low cost cooling. Easy to install, inexpensive to operate. Delivers big value. Write for complete details. USAIRCO shows you how to



Write for special data on wheels, housings and light duty assemblies.



sell and install comfort cooling. Complete merchandising helps.

UNITED STATES AIR CONDITIONING CORP.  
NORTHWEST TERMINAL  
MINNEAPOLIS, MINNESOTA, U. S. A.

# • BARBER

## Gas Pressure REGULATORS

for Reliability!

Certified by A. G. A. Testing Laboratory.  
Write for Catalog and prices on Barber  
Conversion Burners, Appliance Burners,  
and Regulators.

THE BARBER GAS BURNER CO.

3702-4 Superior Avenue

CLEVELAND

OHIO



Sizes 1/4" up

# SPOT WELD

WITH AN

## ACME "Hot Spot" WELDER

Proven utility for over 25 years in  
thousands of sheet metal fabricating  
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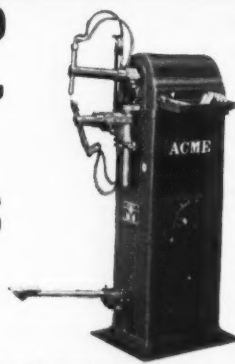
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## Evaporative Cooling A Bowling Alley

(Continued from page 54)

spray through which the air passes for cleaning and which further cleans the mat so that leaving air is clean, odorless and lowered in temperature.

As the drawing shows, five 10,000 cfm units are used to introduce into the alleys 50,000 cfm. All of this air is taken in from outdoors—no building air is recirculated. In order to assist in exhausting this air rapidly after the air has passed over the foul line and spectator section, there was installed three 30-inch roof type attic ventilator units and two rotary roof ventilators. This combination of five supply fans and three exhaust fans plus two exhaust ventilators provides an air change in each 1½ minutes. Cooling of the air is thus combined with ventilation, smoke and odor removal.

Direction of the air indoors is accurately controlled by means of adjustable grilles (see interior photograph) placed so that air at correct velocity is thrown toward the foul line and the spectators. These grilles have two sets of blades—one set horizontally to direct the air stream up and down; the other set vertically to spread the air stream right and left. Each blade in each set is adjusted individually.

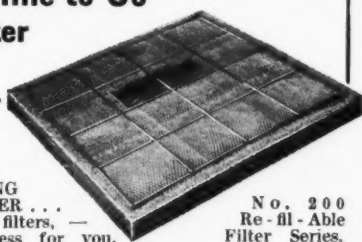
The control system employed is so arranged that while each supply unit can be stopped and started individually, a push button control on a panel operates all units in a single operation. Of interest, also, is the humidistat which is set at 70 per cent RH and stops the recirculating pump thus shutting off all water supply whenever the indoor relative humidity reaches 70 per cent. The centrifugal blowers continue to run at full speed so that even though additional dry bulb temperature reduction is not desired, ventilation continues and the air is changed each 1½ minutes to remove smoke, odors, and to provide cooling by air motion.

As the drawings show, the principle air volume is concentrated over the players and spectators end of the alleys. That the installation fully satisfies requirements is indicated by the owner's purchase of two additional units to take care of several new alleys now being installed. When completed, 70,000 cfm will be introduced into the building.

The drawing also shows the placement of the units on a special platform on the roof and the duct work which conveys air from blower unit to inside grilles. Notes on the drawing indicate the method of water-proofing and insulating the units and duct work. Note that the insulation is inside the ducts to obtain sound deadening as well as insulation.

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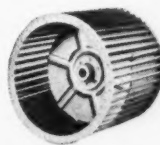
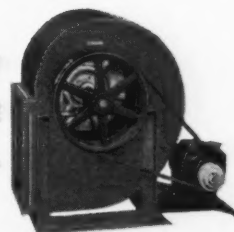
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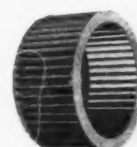


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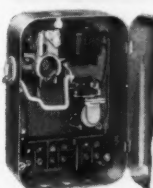
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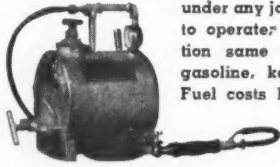


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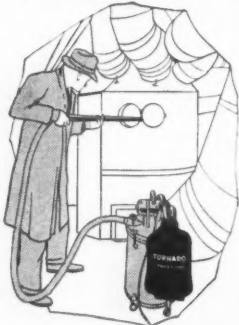
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## Rearmament Cannot Progress Without Construction

(Continued from page 45)

This, again, means that housing will be required—tens of thousands of houses or housing units—wholly new communities with all the facilities of American life. These new communities, depending as they do and will, on production for war may, after peace, continue as in war times or they may dribble to "ghost" towns whose ultimate status we can all picture too vividly.

### Prospects Are for Many Houses

What, then, are the immediate prospects for the warm air heating-sheet metal fabricating industry?

We are not a "hub" industry—neither are we producers of ice cream, radios, refrigerators, fur coats, or dozens of other luxuries which Washington claims we can do wholly or partly without.

So long as we continue to expand our national facilities for war production our industry ought to be busy. Factories mean people and people mean houses. Houses mean heating plants and drainage. What the ultimate number will be—where these houses will be built depends on the war. It can well be that this activity is only now beginning and may continue at ever accelerating pace for several years.

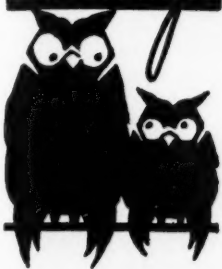
Until such time as we have factories to produce the materials of war at the pace demanded today, we must build new and rehabilitate old factories. New or old, these buildings must have ventilating systems, fume and material removal systems, heating systems, and the other facilities our industry customarily furnishes. We may even find, if production needs twenty-four hours work a day, that ventilating and air conditioning must be much more elaborate than we think essential now.

In 1940 our industry enjoyed one of its busiest years. Those larger shops equipped to handle rearmament sub-contracts worked two and three shifts. There was, toward the end of the year, some difficulty reported in obtaining certain quantities or sizes or types of sheets particularly by small quantity buyers who had grown accustomed to "same day" delivery of one bundle of iron. Probably, as the demand for materials and equipment increases, this delay will increase, but if our industry is as essential as this editorial indicates we should find ourselves pretty far up on any "priority" list or find it possible to obtain preference if we need it.

Stripped to essentials, much of the confusion in our speculation falls away. America can't pursue the war without our industry playing an important role.



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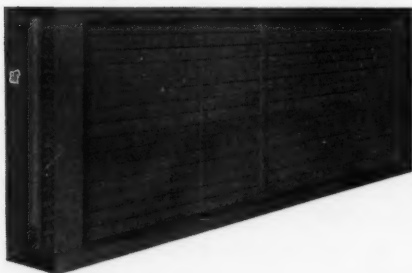
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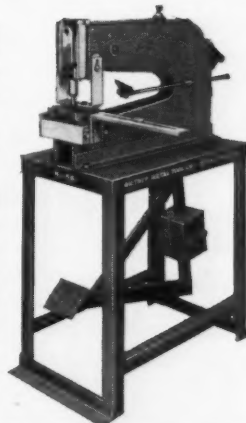
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2100 Washington Ave. St. Louis, Mo.

## Zone Switchover Cooling System

(Continued from page 61)

the south zone damper motor is open and the south zone damper closed, thereby shutting off the air supply to office number 1 from the south zone.

When office number 1 thermostat setting has been satisfied it breaks the circuit to the north zone damper motor, thereby closing the damper. If the temperature in this office is maintained at the thermostat setting, the thermostat reaches a center or zero position and both the north and south zone dampers remain closed. If, however, the temperature in the office continues to rise and reaches a temperature  $1\frac{1}{2}^{\circ}$  higher than the thermostat setting, the thermostat closes the electric circuit to the south zone damper motor which opens the south zone damper and admits the cooler air from this zone duct into the office.

When no heat is being supplied the north zone, as in summer, the air temperature in the duct is below the  $100^{\circ}$  F. setting of the duct thermostat and the relay actuated by the duct thermostat is in the open position, in which position the north zone damper will remain in the closed position. With the north zone damper to office number 1 closed all air for cooling is supplied from the south zone duct which is always in the open position during the summer months. In summer the air supply to the north part of the floor is sometimes cut off due to satisfied temperature conditions and the possibility of the air supply to office number 1 being cut off during the summer before it is properly cooled is eliminated.

In winter, when office number 3 requires heating, as in the case of office number 1, it also is supplied with warm air from the north zone duct until such time as the thermostat is satisfied when the north zone damper closes. Again, as in office number 1, if the temperature rises  $1\frac{1}{2}^{\circ}$  above the thermostat setting the south zone damper is opened, thereby allowing a supply of cooler air to enter the office.

In summer, office number 3 often requires additional cooling after the north zone thermostat has been satisfied and the air supply to this zone cut off. To insure proper cooling this office also receives its cool air supply from the south zone duct, since the relay actuated by the duct thermostat set at  $100^{\circ}$  F. does not allow the thermostat located in office number 3 to open the north zone damper.

As will be noted from Fig. 2, the center or number 2 office is also connected to both zone ducts and the air supply to this office taken from the two zones is controlled in the same manner as described for offices 1 and 3.

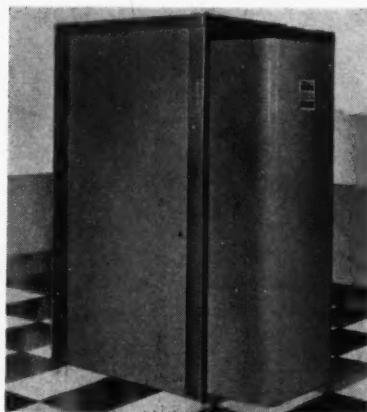
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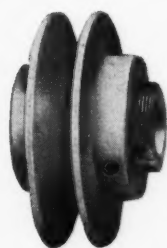
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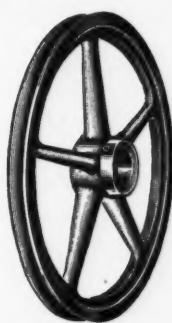
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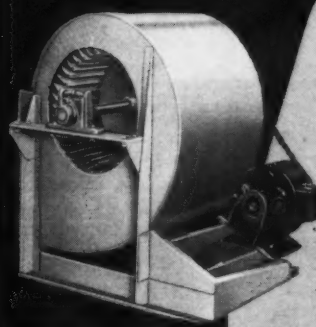
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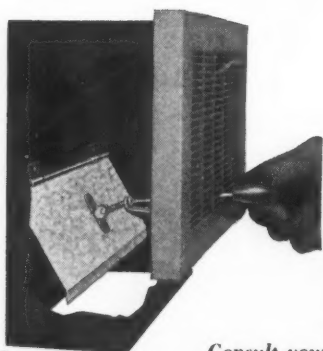
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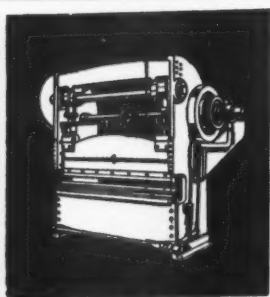
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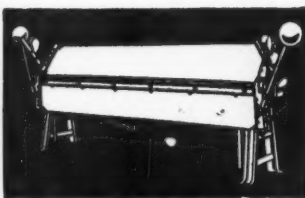
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### PEERLESS FOUNDRY COMPANY

1853 LUDLOW AVENUE

INDIANAPOLIS, IND.

## Hot Dip Tinning Milk and Ice Cream Cans

*(Continued from page 84)*

of the greases. The process cannot be hurried as a definite required time must be allowed for each operation. Care is of course not to be forgotten, and the cleanliness of the solutions has already been mentioned. Finally as mentioned many times, the temperature is the most important single item or factor to watch closely, and too much importance cannot be attached to the quality of the tin and other raw materials. It is impossible to obtain a high quality material cheap, or at a reduced price. The quality always suffers when the price is less, and often endless trouble and expense are caused by trying some new cheaper raw material. It is best to stick to the standard high quality raw materials and pay the price for quality materials; generally it is possible to obtain the greatest savings by improved technique, and complete teamwork and harmony among the operators and the management.

The following tinning solders have been used very successfully for soldering all kinds of hot-dipped tinned articles such as milk cans, ice cream cans, dairy pails, etc.:

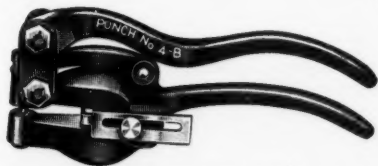
### Solder for Milk and Ice Cream Cans

80 to 100	445 lbs. tin	555 lbs. lead
85 to 100	460 lbs. tin	540 lbs. lead
90 to 100	474 lbs. tin	526 lbs. lead

The following precautions should be observed: They have been mentioned in various places before, but are summarized at this time to call attention to the important factors in order that success of tinning may be assured.

1. Use good *Straits tin*.
2. Use a thermometer or pyrometer on every pot; do not attempt to either tin, or retin by guessing temperatures.
3. Use a small hand thermometer for knowing your pickle bath temperatures, and test your pickling solutions for acid strength and iron content. Empty at 8% iron.
4. Watch overheating of the tin bath; a temperature of 600° F. is too high. Always work at as low a temperature as possible; the one that gives a light, smooth, bright coating.
5. Watch that the solutions are not carried from one tank into the next; contamination is the hidden factor of greatly increased costs.
6. Tin is expensive; care and cleanliness are of the utmost importance; use only a good soft brand of *Straits tin*.
7. Do not guess at anything; there is equipment available to know the conditions attending every operation.
8. There is no cheap, easy, short method for good high quality hot-dip tinning.

# WHITNEY LEVER PUNCHES



**NUMBER  
FOUR "B"  
PUNCH**

This punch for sheet metal work has a capacity of  $\frac{1}{4}$ " through 16 gauge. Weight 8 lb. Length  $8\frac{1}{2}$ ". Depth of throat 2". Complete tool includes three punches and three dies of specified sizes with die adjusting key. A time-saver for your up-to-date shop.

And here's another handy tool for the modern shop—the No. 2 Punch. Length 23". Capacity  $5/16$ " through  $\frac{1}{4}$ " iron, weight 12 lbs., depth of throat 1-11/16". Punches and dies  $3/32$ " to  $\frac{1}{2}$ " by  $1/64$ ".



**NUMBER TWO  
PUNCH**



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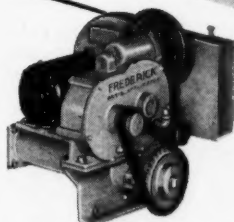
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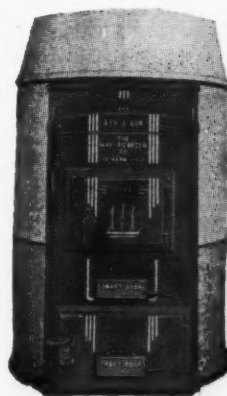
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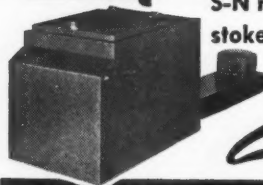
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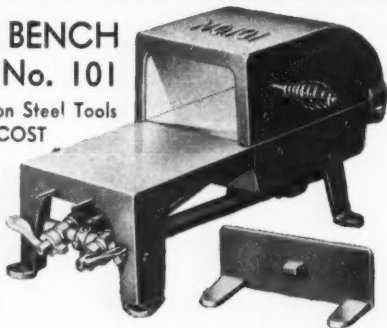


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## Kruckman's Washington Letter

(Continued from page 46)

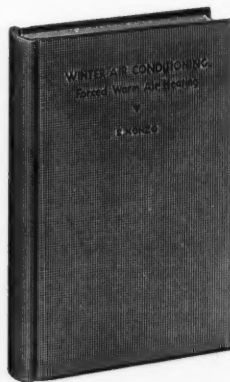
It was brought out that it cost \$1,090 per soldier to house the troops in temporary buildings at Ft. Meade, while permanent homes were constructed at nearby Frederick, Md., for \$1,056 per person. The Quartermaster officers appeared to estimate that 90% of the carpenters on the job were "barn" carpenters, while the rest were "cabinet" craftsmen. Experts testified that the normal cost of the Meade barracks was \$8,000, while the cost under the emergency conditions had been at least \$15,000.

### Camp Meade Under Scrutiny

One of the most interesting sessions was devoted to a study of the juxtaposition of the old Ft. Meade site, of World War 1, to this present Ft. Meade. It was revealed that the first World War camp housed 43,000 men and cost \$900,000. This new camp houses 30,000 men and has cost \$24,500,000. The original estimate was \$8,500,000. The first Camp Meade was located on flat level ground; the present site has been notable for its extraordinary hilliness and mud. There are miles of main and lateral sewer lines on the old site, used in 1917, and miles of concrete roads on the old site. It was testified the roads and sewers on the old site could have been made useful with little additional improvement. The new site has 146,000 feet of sewers, installed with extraordinary difficulty by reason of the rough contour and the character of the soil. It was originally estimated the utilities would cost \$766,264; the final cost, as reported to Congress, exceeds \$2,630,550.

Over \$2,000,000 was paid to workers as "premiums," disbursements for which the Government received no return. It apparently was intended that it should be under-

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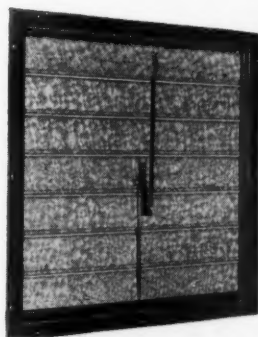
stood these funds went to Labor Unions as fees for the memberships of those who joined when they went on the job.

The hearings also brought from a group of newspaper correspondents who had toured the country visiting defense plants the declarations that generally speaking housing conditions frequently were found to be "frightful." They remarked upon the lack of proper heating installations, the absence of sewers and the lack of most of the things that were conspicuously present in the military camps. It appeared to the correspondents the workers in defense communities should be provided with the same protection for health and comfort which surround the soldiers.

### Civilian Housing to Equal Army

The discussion is an important factor in the impending Army building program. This program chiefly involves defense plants and defense communities. There is every likelihood Congress will emphatically insist that the facilities absent in the first series of projects must be provided for the protection of the workers who will be employed in the second series of plants and towns.

The Army is drafting specifications for the equipment used in installing heating, roofing, spouts, plumbing and air conditioning facilities in defense jobs. It is significant of something that the Government has bought so many trailers, for its trailer camps, that premiums are now offered for all trailers that can be found anywhere in the United States. Trailers and prefabricated houses are the present trend to solve the housing problems in all parts of the defense economy of the country. Thousands of prefabricated houses have been ordered.



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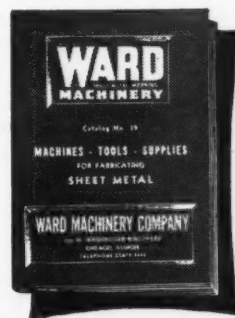
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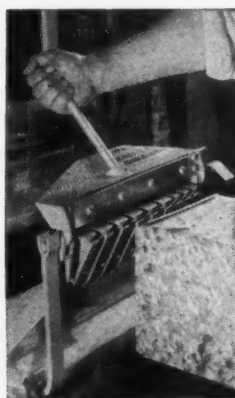


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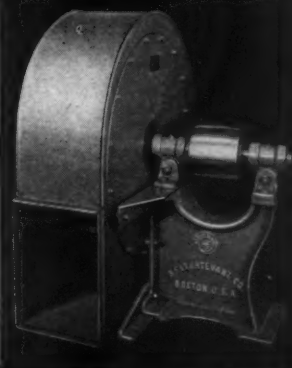
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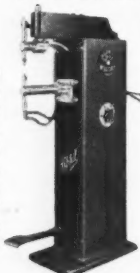


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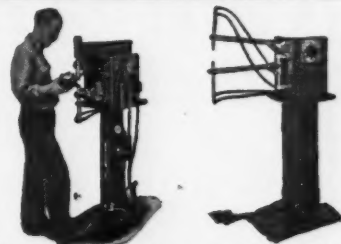
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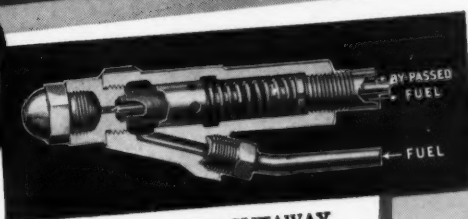
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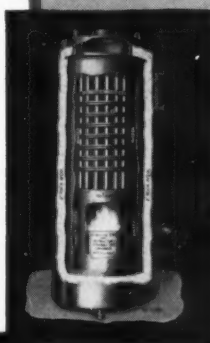
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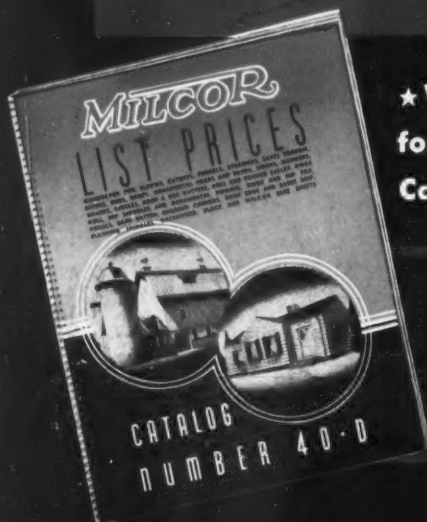
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